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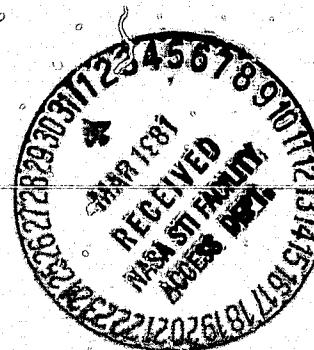
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by

A. M. GALLO
B. DALE

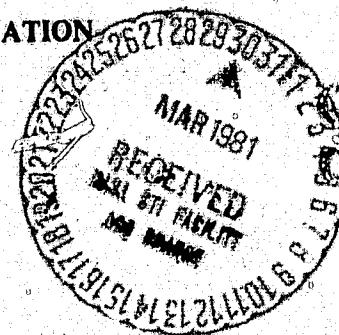
BELL AEROSPACE TEXTRON
P. O. BOX 1
Buffalo, New York 14240



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONTRACT NAS3-20382

NASA LEWIS RESEARCH CENTER
CLEVELAND, OHIO



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INTRODUCTION

A computer program based on state-of-the-art compressor and structural technologies applied to bladed shrouded discs has been developed and made operational in NASTRAN Level 16.

The problems encompassed include aeroelastic analyses, modes and flutter.

The program is documented in the form of five NASA Contractor's Reports — one Technical Report and four Updates to NASTRAN Level 16 Theoretical, User's, Programmer's and Demonstration manuals. This report describes the Programmer's manual updates.

PROGRAMMER'S MANUAL UPDATES

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DATA BLOCK AND TABLE DESCRIPTIONS

Card Type Formats Cont'd.:

BDYS (Open Ended)	SID G2 ...	G1 C2 -1	-1
BDYS1 (Open Ended)	SID G2	C ...	G1 -1
CONCT (Open Ended)	SID SUBB GA ...	C GA GB -1	SUBA GB -1
CONCT1 (Open Ended)	NSUB ... G11 C2 G ₂ ,NSUB	SID NAME NSUB ... G21 ... -1	NAME1 C1 G ₁ ,NSUB -1
CRIGD1 (Open Ended) and CRIGD2 (Open Ended)	EID G11 G14 G2 G23 G26 GM1 GM4 -1 -1 -1	IG G12 G15 G21 G24 .. GM2 GM5 N -1	G1 G13 G16 G22 G25 GM GM3 GM6 -1 -1
CSP (open ended)	SID GA2 ...	GA1 GB2 GA _n -1	GB1 ... GB _n
CYJ0IN (Open Ended)	SIDE G2	C ...	G1 -1
GNEW (5 words)	SID GID	NAME GID0	C
GTRAN (4 words)	TID TRAN	NAME	GID
L0ADC (Open Ended)	SID NAME2 ... -1	S ID1 ... -1 (blank)	NAME1 S1 ... (blank)
MPC (Open Ended)	SID A A C -1	G G .. -1	C G -1
MPCADD (Open Ended)	SID ...	S1 S _n	S2 -1
MPCAX (Open Ended)	SID V ...	RID -1	C -1

See Section 4.6.2 for additional information.

DATA BLOCK DESCRIPTIONS

2.3.86 Data Blocks Output from Module ALG

2.3.86.1 CASECCA (Table)

Description

See description and format of CASECC table - Section 2.3.1.1.

2.3.86.2 GEOM3A (Table)

Description

See description and format of GEOM3 table - Section 2.3.2.3.

DATA BLOCK DESCRIPTIONS

2.3.87 Data Blocks Output from Module APDB

2.3.87.1 AERØ (Table)

Description

See description and format of AERØ table - Section 2.3.62.8.

2.3.87.2 FLIST (Table)

Description

See description and format of FLIST table - Section 2.3.62.11.

2.3.87.3 GTKA (Matrix)

Description

See description and format of GTKA matrix - Section 2.3.63.1.

2.3.87.4 PVECT (Matrix)

Description

{ PVECT } - Partitioning vector for cyclic modes.

Matrix Trailer

Number of columns	= 1
Number of rows	= NEIGV (for KINDEX > 0, 2 + NEIGV)
Form	= rectangular
Type	= real-single precision

DATA BLOCK DESCRIPTIONS

2.3.87.5 ACPT (Table)

Description

Aerodynamic connection and property table for compressor blades. Contains one record for each compressor blade.

Table Format

Record	Word	Type	Item
0	1-2	B	Data block name (ACPT)
1	1	I	Key word, 6 for compressor blades
	2	I	IREF parameter
	3	R	MINMACH parameter
	4	R	MAXMACH parameter
	5	I	Number of blade streamlines, NLINES
	6	I	Number of stations on blade, NSTNS
	7	I	Streamline number, SLN
	8	I	Number of stations on streamline, NSTNSX
	9	R	Stagger angle, STAGGER
	10	R	Chord length, CHORD
	11	R	Radius of streamline, RADIUS
	12	R	Blade spacing, BSPACE
	13	R	Mach number, MACH
	14	R	Gas density, DEN
	15	R	Flow velocity, VEL
	16	R	Flow angle, FLOWA
	17	R	X-coordinate, basic
	18	R	Y-coordinate, basic
	19	R	Z-coordinate, basic
2			Additional records for other blade

Table Trailer

Word 1 = 1
Word 2-6 = zero

Notes

1. Words 7-19 are repeated for each streamline. There are NLINES streamlines and they are from the blade root to the blade tip. These data items are taken from the STREAML2 bulk data cards.
2. Words 17-19 are repeated for each node on the streamline. There are NSTNS triplets (X, Y, Z). They are from the blade leading edge to the blade trailing edge.

EXECUTIVE TABLE DESCRIPTIONS

MODULE PROPERTIES LIST									
MPLID	NWDS	WD1	MOD-NAME	TYP	IN	DUT	SCP	RCF	ID TYP P
162	15	2242	EOMCK	1	12	1	7	20	PARA Y F T E O S --- W1-W2 FLG DEFAULT (IF ANY)
163	29	2257	ALG	1	7	2	4	13	1. INT 2249 0 2. INT 2251 -1 3. INT 2253 --- NO DEFAULT --- 4. BCD 2254 NONE 4-5
164	7	2286	CSA	1	4	1	1	6	NO PARAMETERS EXIST
165	20	2293	APDB	1	7	5	5	17	1. INT 2300 --- NO DEFAULT --- 2. INT 2301 --- NO DEFAULT --- 3. PSP 2302 1.010E 30 1 4. RSP 2304 8.0090E-01 4 5. INT 2306 -1 5 6. BCD 2308 CCSINE 6-7 7. INT 2311 --- NO DEFAULT --- 8. INT 2312 --- NO DEFAULT --- 9

2.4-49 (9/30/78)

DATA BLOCK AND TABLE DESCRIPTIONS

MPL ID NWDS HD1 MOD-NAME TYP IN OUT SCP TOT ID TYP P DEFAULT (IF ANY) W1-W2 FLC

*** END OF MPL PRINTOUT

*** THE MPL CONTAINS 165 ENTRYS. OF THESE, 0 ARE PAD ENTRYS.

DATA BLOCK AND TABLE DESCRIPTIONS

MODULE - DMAP NAME - MODULE ENTRY - LINKS MODULE RESIDES IN ON 360
 INDEX OF MODULE POINT NAME

154	SUBPHI	15
155	PLTMRG	15
156	COPY	7
157	SWITCH	7
158	MPY3	7
159	SDCMPS	15
160	LODAPP	15
161	GPSPC	4
162	EQWCK	14
163	ALG	6
164	CSA	6
165	APDR	9

GENERAL COMMENTS AND INDEXES

4.1.2 Alphabetical Index of Module Functional Descriptions

<u>Section Number</u>	<u>Module Name</u>	<u>Section Number</u>	<u>Module Name</u>
4.78	ADD	4.32	GPSP
4.96	ADD5	4.29	GPWG
4.149	ALG	4.21	GP1
4.114	ANG	4.22	GP2
4.115	AMP	4.25	GP3
4.112	APD	4.31	GP4
4.150	APDB		
4.217	ASDMAP		
***	BEGIN	4.5	IFP*
4.90	BMG	4.3	IFP1
4.56	CASE	4.6	IFP3*
4.59	CEAD	4.89	IFP4*
4.10	CHKPNT	4.91	IFP5*
4.128	CØMB1	4.97	INPUT
4.129	CØMB2	4.98	INPUTT1
4.13	CØND	4.99	INPUTT2
4.148	CØPY	**	INPUTT3
4.110	CYCT1	**	INPUTT4
4.111	CYCT2	4.12	JUMP
**	DDR	**	LABEL
4.141	DDRMM	4.72	MATGPR
4.67	DDR1	4.71	MATPRN
4.68	DDR2	4.73	MATPRT
4.81	DECØMP	4.33	MCE1
4.143	DIAGØNAL	4.34	MCE2
4.47	DPD	4.84	MERGE
4.121	DSCHK	**	MØDA
4.49	DSMG1	4.126	MØDACC
4.51	DSMG2	**	MØDB
**	DUMMØD1	**	MØDC
**	DUMMØD2	4.79	MØYAD
**	DUMMØD3	4.57	MTRXIN
**	DUMMØD4	4.70	ØFP
4.123	EMA	4.120	ØPTPR1
4.124	EMG	4.142	ØPTPR2
4.18	END	**	ØOUTPUT
4.17	EQUIV	4.100	ØOUTPUT1
4.130	EXIØ	4.101	ØOUTPUT2
4.14	EXIT	4.102	ØOUTPUT3
		**	ØOUTPUT4
4.116	FA1	4.19	PARAM
4.117	FA2	4.118	PARAML
4.82	FBS	4.119	PARAMR
***	FILE	4.83	PARTN
4.61	FRRD	**	PARTVEC
		4.52	PLA1
4.113	GI	4.53	PLA2
4.58	GKAD	4.54	PLA3
4.66	GKAM	4.55	PLA4
4.109	GPCYC	4.24	PLØT
4.146	GPFDR		

* Executive System Internal Module, ** Dummy Module,
 *** Executive System Instruction (No Module Functional Descriptions)

MODULE FUNCTIONAL DESCRIPTIONS

4.1.3 Alphabetical Index of Entry Points in Module Functional Descriptions

<u>Section Number</u>	<u>Entry Point</u>	<u>Module Name</u>	<u>Page Number</u>
4.46.8	AI	SDR2	4.46-7
4.114.8.18	AKAPM	AMG	4.114-9b
4.114.8.18	AKAPPA	AMG	4.114-9b
4.114.8.18	AKP2	AMG	4.114-9b
4.114.8.18	ALAMDA	AMG	4.114-9b
4.59.8.25	ALLMAT	CEAD	4.59-18
4.46.8	AMATRX	SDR2	4.46-7
4.114.1	AMG	AMG	4.114-1
4.114.8.12	AMGB1	AMG	4.114-9
4.114.8.13	AMGB1A	AMG	4.114-9
4.114.8.14	AMGB1B	AMG	4.114-9a
4.114.8.15	AMGB1C	AMG	4.114-9a
4.114.8.16	AMGB1D	AMG	4.114-9b
4.114.8.20	AMGB2	AMG	4.114-9c
4.114.8.21	AMGB2A	AMG	4.114-9c
4.115.1	AMP	AMP	4.115-1
4.115.8.1	AMPA	AMP	4.115-8
4.115.8.2	AMPB	AMP	4.115-9
4.115.8.3	AMPB1	AMP	4.115-9
4.115.8.4	AMPB2	AMP	4.115-10
4.115.8.5	AMPC	AMP	4.115-10
4.115.8.6	AMPC1	AMP	4.115-10
4.115.8.7	AMPC2	AMP	4.115-12
4.115.8.8	AMPD	AMP	4.115-12
4.112.1	APD	APD	4.112-1
4.150.8	APDB	APDB	4.150-1
4.150.8.1	APDB1	APDB	4.150-4
4.112.8.2	APDF	APD	4.112-3
4.112.8.1	APDI	APD	4.112-3
4.48.8.25	ARRM	READ	4.48-18
4.127.1	ASDMAP	ASDMAP	4.127-1
4.127.8.1	ASPRØ	ASDMAP	4.127-6
4.114.8.18	ASYCØN	AMG	4.114-9b
4.7.5.13	AUTØCK	XGPI	4.7-6
4.7.5.14	AUTØSV	XGPI	4.7-7
4.41.11.35	BAR	SSG1	4.41-27
4.41.11.21	BASGLB	SSG1	4.41-22
4.128.8.4	BDATO1	CØMBT	4.128-11

MODULE FUNCTIONAL DESCRIPTIONS

<u>Section Number</u>	<u>Entry Point</u>	<u>Module Name</u>	<u>Page Number</u>
4.128.8.5	BDAT02	C0MB1	4.128-12
4.128.8.8	BDAT03	C0MB1	4.128-14
4.128.8.10	BDAT04	C0MB1	4.128-20
4.128.8.6	BDAT05	C0MB1	4.128-12
4.128.8.7	BDAT06	C0MB1	4.128-13

GENERAL COMMENTS AND INDEXES

<u>Section Number</u>	<u>Entry Point</u>	<u>Module Name</u>	<u>Page Number</u>
4.41.11.17	FNDPNT	SSG1	4.41-21
4.24.8.12	FNDSET	PLØT	4.24-11
4.41.11.20	FNDSIL	SSG1	4.41-22
4.73.8.4	FØRMAT	MATPRT	4.73-4
4.31.8.3	FØRMGG	GP4	4.31-6
4.65.8.4	FØRM1	TRD	4.65-12
4.65.8.10	FØRM2	TRD	4.65-15
4.41.11.10	FPØNT	SSG1	4.41-19
4.61.1	FRRD	FRRD	4.61-1
4.61.8.1	FRRD1A	FRRD	4.61-5
4.61.8.2	FRRD1B	FRRD	4.61-6
4.61.8.3	FKRUDC	FRRD	4.61-6
4.61.8.4	FRRD1D	FRRD	4.61-6
4.61.8.5	FRRD1E	FRRD	4.61-7
4.61.8.6	FRRD1F	FRRD	4.61-7
4.46.8	F6211	SDR2	4.46-7
4.46.8	F89	SDR2	4.46-7
4.114.8.19	GAUSS	AMG	4.114-9c
4.41.11.60	GBTRAN	SSG1	4.41-35
4.114.8.3	GEND	AMG	4.114-4
4.24.8.4	GFTDEF	PLØT	4.24-6
4.113.8.1	GI	GI	4.113-8
4.113.8.2	GIGGKS	GI	4.113-8
4.113.8.4	GIGTKA	GI	4.113-8
4.113.8.3	GIPSST	GI	4.113-8
4.58.1	GKAD	GKAD	4.58-1
4.58.8.1	GKAD1A	GKAD	4.58-7
4.58.8.2	GKAD1B	GKAD	4.58-7
4.58.8.3	GKAD1C	GKAD	4.58-8
4.58.8.4	GKAD1D	GKAD	4.58-8

GENERAL COMMENTS AND INDEXES

<u>Section Number</u>	<u>Entry Point</u>	<u>Module Name</u>	<u>Page Number</u>
4.46.8.7	STRBS1	SDR2	4.46-10
4.46.8.53	STRIAI	SDR2	4.46-23
4.46.8.55	STRIA2	SDR2	4.46-23
4.46.8.16	STRIR1	SDR2	4.46-12
4.46.8.32	STRIR2	SDR2	4.46-17
4.46.8.10	STRME1	SDR2	4.46-11
4.46.8.8	STRPL1	SDR2	4.46-10
4.46.8.13	STRQD1	SDR2	4.46-12
4.46.8.28	STRQD2	SDR2	4.46-16
4.46.8.5	STUBE1	SDR2	4.46-10
4.48.8.13	SUB	READ	4.48-11
4.114.8.18	SUBA	AMG	4.114-9b
4.114.8.18	SUBB	AMG	4.114-9b
4.114.8.18	SUBC	AMG	4.114-9b
4.114.8.18	SUBD	AMG	4.114-9b
4.114.8.5	SUBP	AMG	4.114-5
4.138.1	SUBPH1	SUBPH1	4.138-1
4.48.8.26	SUMM	READ	4.48-18
4.24.8.19	SUPLT	PLOT	4.24-12c
4.147.1	SWITCH	SWITCH	4.147-1
4.3.7.7	SWSRT	IFP1	4.3-6
4.103.1	TABFMT	TABPRT	4.103-1
4.122.1	TABPCH	TABPCH	4.122-1
4.75.1	TABPT	TABPT	4.75-1
4.26.8.1	TA1	TA1	4.26-14
4.26.8.2	TA1A	TA1	4.26-14
4.26.8.3	TA1B	TA1	4.26-15
4.26.8.5	TA1C	TA1	4.26-15
4.26.8.6	TA1CA	TA1	4.26-15
4.26.8.8	TA1ETO	TA1	4.26-15
4.26.8.4	TA1H	TA1	4.26-15
4.41.11.3	TEMPL	SSG1	4.41-15
4.41.11.43	TETRA	SSG1	4.41-29
4.140.1	TIMTST	TIMETEST	4.140-1

GENERAL COMMENTS AND INDEXES

<u>Section Number</u>	<u>Entry Point</u>	<u>Module Name</u>	<u>Page Number</u>
4.85.1	TRNSP	TRNSP	4.85-1
4.41.11.58	TRTTEM	SSG1	4.41-34
4.41.11.46	TRPLT	SSG1	4.41-30
4.41.11.30	TTOROR	SSG1	4.41-25
4.41.11.29	TTRAPR	SSG1	4.41-25
4.41.11.56	TTRIAS	SSG1	4.41-33
4.41.11.28	TTRIRG	SSG1	4.41-25
4.149.8.5	UDG1-UDG9	ALG	4.149-6
4.149.8.5	UD03AN	ALG	4.149-6
4.149.8.5	UD03AP	ALG	4.149-5
4.149.8.5	UD03AR	ALG	4.149-6
4.149.8.3	UD03PB	ALG	4.149-4
4.149.8.4	UD03PØ	ALG	4.149-4
4.149.8.2	UD03PR	ALG	4.149-4
4.149.8	UD0300	ALG	4.149-1
4.149.8.5	UD0301-UD0319	ALG	4.149-6
4.149.8.5	UD0325	ALG	4.149-6
4.149.8.5	UD0329	ALG	4.149-6
4.149.8.5	UD0330	ALG	4.149-6
4.8.1	UMFEDT	UMFEDIT	4.8-1
4.8.6	UMFZBD	UMFEDIT	4.8-2
4.48.8.29	VALVEC	READ	4.48-19
4.60.8.1	VDR	VDR	4.60-6
4.60.8.2	VDRA	VDR	4.60-6
4.60.8.3	VDRB	VDR	4.60-6
4.60.9.2	VDRBD	VDR	4.60-7
4.95.1	VEC	VEC	4.95-1
4.73.8.3	VECPRT	MATPRT	4.73-3
4.48.8.39	WILVEC	READ	4.48-19e

GENERAL COMMENTS AND INDEXES

<u>Section Number</u>	<u>Entry Point</u>	<u>Module Name</u>	<u>Page Number</u>
4.76.8.2	WRTMSG	PRTMSG	4.76-2
4.24.8.17	WRTPRT	PLBT	4.24-12a
4.4.5.5	XBCDBI	XSORT	4.4-4
4.7.6.2	XBSBD	XGPI	4.7-10
4.11.1	XCEI	REPT	4.11-1
4.11.6.1	XCEI	REPT	4.11-2
4.12.1	XCEI	JUMP	4.12-1
4.13.1	XCEI	END	4.13-1
4.14.1	XCEI	EXIT	4.14-1
4.18.1	XCEI	END	4.18-1
4.10.1	XCHK	CHKPNT	4.10-1
4.9.5.2	XCLEAN	XSFA	4.9-4

EXECUTIVE PREFACE MODULE IFP (INPUT FILE PROCESSOR)

Table 1(g). Bulk Data Cards Processed by IFP Sorted by Internal Card Number.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	IJK
233	QHBDY	9	GEØM3	0	9	9	901	0	4309	43	S1	5050	-1		32D5
234	MAT4	3	MPT	0	4	8	198	1	2103	21	S1	3900	-1		32D6
235	MAT5	3	MPT	0	4	8	198	1	2203	22	S1	4000	-1		32E1
236	PHBDY	2	EPT	0	4	8	350	1	2502	25	S1	5100	-1		32E2
237	MATT4	3	MPT	0	4	8	37	1	2303	23	S1	3950	-1		32E3
238	MATT5	3	MPT	0	4	8	37	1	2403	24	S1	4050	-1		32E4
239	QBODY1	9	GEØM3	0	-4	9	774	0	4509	45	S4	1990	-1		32E5
240	QBODY2	9	GEØM3	0	4	8	350	0	4909	49	S1	5150	-1		32E6
241	QVECT	9	GEØM3	0	-4	16	-1	0	5009	50	S1	5200	-1		33A1
242	QVØL	9	GEØM3	0	-4	9	774	0	5209	52	S1	1990	-1		33A2
243	RADLST	14	MATPØØL	0	-4	16	-1	0	2014	20	S1	5250	-1		33A3
244	RADMIX	14	MATPØØL	0	-4	8	-1	0	3014	30	S3	1400	-1		33A4
245	SAME	10	GEØM4	0	-4	10	-1	0	7810	78	S5	4600	-1		33A5
246	SAME1	10	GEØM4	0	-8	9	-1	0	7910	79	S5	5	-1		33A6
247	INPUT	11	GEØM5	0	17	17	-1	0	1310	13	S5	5	-1		33B1
248	ØUTPUT	11	GEØM5	0	17	17	-1	0	1410	14	S5	5	-1		33B2
249	CQDMEM1	8	GEØM2	0	8	12	325	0	2008	20	S1	3460	-1		33B3
250	PQDMEM1	2	EPT	0	4	8	237	0	2202	22	S1	3000	-1		33B4
251	CIHEX1	8	GEØM2	0	12	16	951	1	7108	71	S5	5000	-1		33B5
252	CIHEX2	8	GEØM2	0	24	28	951	1	7208	72	S5	5100	-1		33B6
253	CIHEX3	8	GEØM2	0	36	40	951	1	7308	73	S5	5200	-1		33C1
254	PIHEX	2	EPT	0	4	12	981	1	7002	70	S5	5300	-1		33C2
255	PLØAD3	9	GEØM3	0	8	12	949	0	7109	71	S5	5400	-1		33C3
256	SPCD	10	GEØM4	0	4	8	101	0	5110	51	S1	1600	-1		33C4
257	CYJØIN	10	GEØM4	0	-4	16	-1	0	5210	52	S1	5240	-1		33C5
258	CNGRNT	8	GEØM2	0	-4	16	-1	0	5008	50	S1	5245	-1		33C6
259	CQDMEM2	8	GEØM2	0	8	12	325	0	5308	53	S1	3460	-1		33D1
260	PQDMEM2	2	EPT	0	4	8	237	0	5302	53	S1	3000	-1		33D2
261	CQDMEM3	8	GEØM2	0	8	12	325	0	5408	54	S1	3460	-1		33D3
262	PQDMEM3	2	EPT	0	4	8	237	0	5402	54	S1	3000	-1		33D4
263	CAERO1	4	EDT	0	16	16	39	1	3002	30	S5	6400	-1		33D5
264	PAERO1	4	EDT	0	4	8	803	1	3102	31	S5	6500	-1		33D6
265	AERØ	4	EDT	0	8	12	2	0	3202	32	S5	6600	-1		33E1
266	SPLINE1	4	EDT	0	8	12	42	1	3302	33	S5	6700	-1		33E2
267	SPLINE2	4	EDT	0	12	16	1025	1	3402	34	S5	6800	-1		33E3
268	SET1	4	EDT	0	-4	16	-1	0	3502	35	S1	5300	-1		33E4
269	SET2	4	EDT	0	4	8	197	0	3602	36	S5	5600	-1		33E5
270	MKAERO2	4	EDT	0	4	8	805	0	3702	37	S5	5700	-1		33E6
271	MKAERO1	4	EDT	0	16	16	805	0	3802	38	S5	5800	-1		41A1
272	FLUTTER	4	EDT	0	10	14	1005	1	3902	39	S5	5900	-1		41A2
273	AEFACT	4	EDT	0	-4	16	-1	1	4002	40	S3	1415	-1		41A3
274	FLFACT	4	EDT	0	-4	16	-1	1	4102	41	S3	1415	-1		41A4
275	CBARAO	8	GEØM2	0	9	13	-1	1	4001	40	S5	6100	-1		41A5
276	PLINIT	3	MPT	0	-9	14	-1	0	304	3	S5	6200	-1		41A6
277	PØPT	3	MPT	0	9	13	1017	0	404	4	S5	6300	-1		41B1
278	PLØADX	9	GEØM3	0	8	12	1037	0	7001	70	S5	6900	-1		41B2
279	CRIGD1	10	GEØM4	-2	-4	48	-1	1	5310	53	S3	2010	-1		41B3
280	CQUADTS	8	GEØM2	0	8	20	1045	1	4108	41	S4	2020	-1		41B4
281	PQUADTS	2	EPT	0	8	12	277	1	2402	24	S4	2030	-1		41B5
282	CTRIAATS	8	GEØM2	0	8	20	1047	1	5908	59	S4	2021	-1		41B6
283	PTRIATS	2	EPT	0	8	12	277	1	2302	23	S4	2030	-1		41C1
284	CRIGD2	10	GEØM4	-2	-6	48	-1	1	5410	54	S3	2060	-1		41C2
285	CTRIAAX	15	AXIC	-2	4	8	313	1	7012	70	S3	2111	0		41C3
286	PTRIAAX	2	EPT	-2	4	24	349	1	7032	85	S3	203	0		41C4
287	CTRAPAX	15	AXIC	-2	4	8	325	1	7042	74	S3	2040	0		41C5
288	PTRAPAX	2	EPT	-2	4	24	349	1	7052	95	S3	2030	0		41C6
289	VIEW	2	EPT	0	4	8	326	1	2606	26	S1	5175	0		41D1
290	VARIAN	4	EDT	0	-4	16	-1	0	4202	42	S3	1410	0		41D2
291	CØP	10	GEØM4	0	-4	8	-1	0	3291	91	S3	2910	-1		41D3
292	STREAML1	4	EDT	0	-4	9	-1	1	3292	92	S3	2920	-1		41D4
293	STREAML2	4	EDT	0	12	16	45	1	3293	93	S3	3010	-1		41D5

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX GENERATOR)

Each combination has four influence quadrants (upper left, upper right, lower left, lower right), so these routines must be called four times for each element and then the result summed before SUBP returns. Subroutine INCR0 uses subroutines TKER, IDF1, and IDF2 to compute the final result.

The flow for Section two of the Doublet Lattice method is as follows. Subroutine DLPT2 prepares all the computations necessary. DLPT2 reads the record of ACPT and then loops through each box packing out a column of SKJ, D1JK, and D2JK for each box.

The row position of each pair of values for a column is $2*(\text{box number}-1) + 1$. Successive rows of SKJ have the following form:

$$\text{SKJ} \rightarrow \left[\begin{array}{c} 2.0 * \text{EE}_{\text{strip}} * \text{DELX}_{\text{box}} \\ \hline \text{EE}_{\text{strip}} * \text{DELX}_{\text{box}}^2 / 2.0 \end{array} \right] \quad (1)$$

Successive rows of D1JK have the following form:

$$\text{D1JK} \rightarrow \left[\begin{array}{c} 0.0 \\ \hline 1.0 \end{array} \right] \quad (2)$$

Successive rows of D2JK have the following form:

$$\text{D2JK} \rightarrow \left[\begin{array}{c} -2.0/\text{REFC} \\ \hline \text{DELX}_{\text{box}} / 2.0 * \text{REFL} \end{array} \right] \quad (3)$$

4.114.7.2 Compressor Blade Method

The flow for Section one of the compressor blade method is as follows. Subroutine AMGB1 is the driver for this method. It reads in the ACPT record for this method and locates reference parameters from the reference streamline on the

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX GENERATOR)

blade. If there is enough core available, it calls AMGB1A to output one matrix of the AJJL list. When AMGB1A is through, AMGB1 bumps NR₀W and returns.

Subroutine AMGB1A outputs a portion of the AJJL matrix for each streamline on the compressor blade. Each streamline may be subsonic, transonic or supersonic, depending on the Mach number for that streamline. Subroutine AMGB1B calculates terms for subsonic streamlines. Subroutine AMGB1C calculates terms for supersonic streamlines and subroutine AMGB1D calculates terms for transonic streamlines.

Each submatrix of AJJL corresponds to a blade streamline and is of order NSTNS X NSTNS, where NSTNS is the number of computing stations on the blade. The submatrices are located along the diagonal of AJJL. AJJL transpose is output.

The flow for Section two of the compressor blade method is as follows. Subroutine AMGB2 prepares all the computations necessary. It reads the ACPT record and locates the reference streamline parameters. Subroutine AMGB2A is called to calculate the W factor and matrix $[F^{-1}]$ for each streamline. AMGB2 outputs the NSTNS X NSTNS submatrix for each streamline to the [SKJ] and [D1JK] matrices. Each submatrix of [SKJ] and [D1JK] has the following form:

$$[SKJ] = W \cdot [F^{-1}]^T$$

and

$$[D1JK] = [F^{-1}]^T$$

The [D2JK] matrix is null.

4.114.8 Subroutines

Besides the module driver AMG, the subroutines are divided into groups by method.

For the Doublet Lattice method the subroutines are:

DLAMG, GEND, DPPS, SUBP, SNPDF, INCR₀, IKER, IDF1, IDF2, and DLPT2.

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX GENERATOR)

4.114.8.1 Subroutine Name: AMG

- 1. Entry Point: AMG**
- 2. Purpose: Module driver for AMG - see description above.**
- 3. Calling Sequence: CALL AMG**

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX DISTRIBUTOR)

DIIJR = output - real part of nonplanar integral contribution

DIIJI = output - imaginary part of nonplanar integral contribution

4.114.8.11 Subroutine Name: DLPT2

1. Entry Point: DLPT2

2. Purpose: To output the Doublet Lattice parts for matrices SKJ, D1JK,
and D2JK.

3. Calling Sequence: CALL DLPT2 (INPUT, SKJ, W1JK, W2JK)

INPUT = GINØ number for ACPT

SKJ = GINØ number for SKJ

W1JK = GINØ number for D1JK

W2JK = GINØ number for D2JK

4.114.8.12 Subroutine Name: AMGB1

1. Entry Point: AMGB1

2. Purpose: Driver for the compressor blade method.

3. Calling Sequence: CALL AMGB1 (INPUT, MATØUT)

INPUT = GINØ file number for ACPT

MATØUT = GINØ file number for AJJL

4.114.8.13 Subroutine Name: AMGB1A

1. Entry Point: AMGB1A

2. Purpose: Output all the columns of AJJL associated with a record
of ACPT.

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX DISTRIBUTOR)

3. Calling Sequence: CALL AMGB1A (INPUT, MATOUT, AJJ, AJJT, T\$0NX, TAMACH, TREFD)

INPUT = GINØ file number of ACPT

MATOUT = GINØ file number of AJJL

AJJ = Storage for AJJL submatrices - complex

AJJT = Storage for one column of AJJL

T\$0NX = Stores position of transonic submatrix in AJJL for a particular transonic streamline

TAMACH = Stores Mach numbers of transonic streamlines

TREFD = Stores reduced frequencies of transonic streamlines

4.114.8.14 Subroutine Name: AMGB1B

1. Entry Point: AMGB1B

2. Purpose: Calculates AJJL terms for subsonic streamlines.

3. Calling Sequence: CALL AMGB1B (AJJL)

AJJL = Location to put subsonic AJJL submatrix for this streamline

4.114.8.15 Subroutine Name: AMGB1C

1. Entry Point: AMGB1C

2. Purpose: Calculates AJJL terms for supersonic streamlines.

3. Calling Sequence: CALL AMGB1C (AJJL)

AJJL = Location to put supersonic AJJL submatrix for this streamline

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX DISTRIBUTOR)

4.114.8.16 Subroutine Name: AMGB1D

1. Entry Point: AMGB1D
2. Purpose: Calculates AJJL terms for transonic streamlines.
3. Calling Sequence: CALL AMGB1D (AJJL, T\$0NX, TAMACH, TREDF)

AJJL = AJJL submatrices for all subsonic and supersonic streamlines.

It also contains space for transonic submatrices.

T\$0NX = (integer) - vector - non-zero indicates transonic streamline
zero if known streamline

TAMACH = Vector of streamline Mach numbers

TREDF = Vector of streamline reduced frequencies

4.114.8.17 Subroutine Name: INTERT

1. Entry Point: INTERT
2. Purpose: To linearly interpolate by Mach number a transonic general Air Force matrix given two known streamline matrices.
3. Calling Sequence: CALL INTERT (NL, NL1, NL2, NM, AJJ, TA)

NL = Streamline number of unknown transonic

NL1, NL2 = Two known streamlines

NM = Size of matrix in AJJ = 2 * NSTNS * NSTNS

AJJ = Contains all generalized Air Force matrices for all
streamlines

TA = Vector of streamline Mach numbers

4.114.8.18 Subroutine Names: SUBA, SUBB, SUBC, SUBD, ALAMDA, AKP2, AKAPPA, DLKAPM, ASYCON, AKAPM, DRKAPM

1. Entry Points: The same as above
2. Purpose: Called by AMGB1C

FUNCTIONAL MODULE AMG (AERODYNAMIC MATRIX DISTRIBUTOR)

4.114.8.19 Subroutine Name: GAUSS

1. Entry Point: GAUSS
2. Purpose: Equation Solver used by AMGB1B.
3. Calling Sequence: CALL GAUSS (A, N, NL)

4.114.8.20 Subroutine Name: AMGB2

1. Entry Point: AMGB2
2. Purpose: To output the compressor blade parts for matrices SKJ, D1JK, and D2JK.
3. Calling Sequence: CALL AMGB2 (INPUT, SKJ, W1JK, W2JK)

INPUT = GINØ file number for ACTP

SKJ = GINØ file number for SKJ

W1JK = GINØ file number for D1JK

W2JK = GINØ file number for D2JK

4.114.8.21 Subroutine Name: AMGB2A

1. Entry Point: AMGB2A
2. Purpose: Calculate $[F^{-1}]$ matrix and W factor used in the generation of SKJ and D1JK.
3. Calling Sequence: CALL AMGB2A (INPUT, FMAT, XYZB, INDEX, RADII, WFACT, NLINE)

INPUT = GINØ file number of ACPT

FMAT = Location for $[F^{-1}]$ matrix

XYZB = Location for basic coordinates of nodes on streamline

INDEX = Work storage for INVERS

WFACT = Factor for output

NLINE = Number of streamlines

RADI = Streamline radius

4.114.9 Design Requirements

For Section one, three buffers are allocated at the bottom of core. For Section two, four buffers are allocated at the bottom of core. Each method may have its own open core common block but they must not overlap these buffers.

4.114.9.1 Communication Common Blocks

AMGMN

Words

1-7	MCB	- Trailer for AJJL	
8	NRW	- Last row number output for any method on AJJL	
9	ND	- Y - symmetry flag	
10	NE	- Z - symmetry flag	1 record of AERØ
11	REFC	- Reference chord	
12	FMACH	- Mach number	
13	RFK	- Reduced frequency	Pairs from 2 record of AERØ

MODULE FUNCTIONAL DESCRIPTIONS

4.114.9.3 Common Blocks for Compressor Blade Method

/BAMG1L/ and /BAMG2L/

Words:

- 1 IREF - Reference streamline number
- 2 MINMAC - Parameter MINMACH
- 3 MAXMAC - Parameter MAXMACH
- 4 NLINES - Number of streamlines on blade
- 5 NSTNS - Number of stations on blade
- 6 REFSTG - Reference blade stagger angle
- 7 REFCRD - Reference blade chord
- 8 REFMAC - Reference Mach number
- 9 REFDEN - Reference density
- 10 REFVEL - Reference velocity
- 11 REFFLØ - Reference flow angle
- 12 SLN " Streamline number
- 13 NSTNSX - Number of stations on streamline
- 14 STAGER - Blade stagger angle
- 15 CHØRD - Blade chord
- 16 RADIUS - Radius of streamline
- 17 BSPACE - Blade spacing
- 18 MACH - Relative flow Mach number at blade leading edge
- 19 DEN - Gas density at blade leading edge
- 20 VEL - Relative flow velocity at blade leading edge
- 21 FLØWA - Relative flow angle at blade leading edge
- 22 AMACH - Internal Mach number
- 23 REDF - Internal reduced frequency
- 24 BLSPC - Internal blade spacing
- 25 AMACHR - Internal reference Mach number
- 26 TSØNIC - Transonic indicator

MODULE FUNCTIONAL DESCRIPTIONS

4.115.7.3 Subroutine AMPC

Calculate (or find) Q_{jh} if it is needed. It will be needed if either (a) Q_{jh} is to be output, or (b) Q_{hh} is to be output and is not found on the scratch file. The Q_{jh} and Q_{hh} are not to be output only when their output data blocks are purged. If Q_{jh} can be found on a scratch file, get it from there; otherwise, it must be calculated. First, check to see if $D_{jh}(k)$ has been calculated for the present k . If not, find it by

$$[D_{jh}] = [D_{jh}^{(1)}] + i k [D_{jh}^{(2)}] , \quad (6)$$

and save for possible later use. Next, solve for Q_{jh} . The algebra included here will be theory dependent. The header record of AJJL will specify aerodynamic groups (see Section 4.115.7.5). Retrieve the submatrix $[A_{jj}]$ from AJJL and transpose it. If there is more than one group, D_{jh} must be unpacked into row groups. For each group, solve for $[Q_{jh}]$, then pack the groups. For Doublet Lattice method,

$$[Q_{jh}]_{\text{group}} = [A_{jj}^T]_{\text{group}}^{-1} [D_{jh}]_{\text{group}} . \quad (7)$$

For the compressor blade method, retrieve the submatrix $[A_{jj}]$ from AJJL and compute

$$[Q_{jh}] = [A_{jj}^T]^T [D_{jh}] .$$

There are no groups for the compressor blade method.

For other methods (including Doublet Lattice with bodies), the algebra will be specified at a later time, and the code will have to be added to the module.

4.115.7.4 Subroutine AMPD

Calculate (or find) $[Q_{hh}]$ if it is needed. It will be needed unless the output data block is purged. If $[Q_{hh}]$ can be found on a scratch file, get it there; otherwise, it must be calculated. If it must be calculated $[Q_{jh}]$ will be available. To compute $[Q_{hh}]$

$$[Q_{kh}] = [S_{kj}][Q_{jh}] \quad , \quad (8)$$

$$[Q_{ih}] = [G_{ki}]^T [Q_{kh}] \quad , \quad (9)$$

$$[Q_{hh}] = \text{Merge} \begin{bmatrix} Q_{ih} \\ Q_{eh} \end{bmatrix} \quad , \quad (10)$$

where $[Q_{eh}]$ is zero. Note that this requires only an update of $[Q_{in}]$'s trailer.

Check the time. If $[Q_{jh}]$ and $[Q_{hh}]$ were calculated (rather than found), then the time per calculation can be found. If the time per calculation is known and it is not enough (with a 10% margin), no more loops should be attempted.

MODULE FUNCTIONAL DESCRIPTIONS

4.115.8 Subroutines

Numerous utility subroutines are used by the functional phases as shown below.

<u>AMPA</u>	<u>AMPB</u>	<u>AMPC</u>	<u>AMPD</u>
CYCT2B	CALCV	CYCT2B	CYCT2B
	SSG2B	SSG2C	SSG2B
	MERGED	CFACTR.	
	PARTN	CFBSØR	
		FILSWI	
		TRANP1	
		SSG2B	

4.115.8.1 Subroutine Name: AMPA

1. Entry Point: AMPA

2. Purpose: To provide a scenario for later phases and to prepare for use of the appended output files.

3. Calling Sequence: CALL AMPA (AERØ, QJHL, QHHL, AJJL, QHHLØ, QJHLØ, INDEX, IMAX, IANY)

AERØ, QJHL, QHHL, and AJJL are the GINØ file numbers of their respective data blocks.

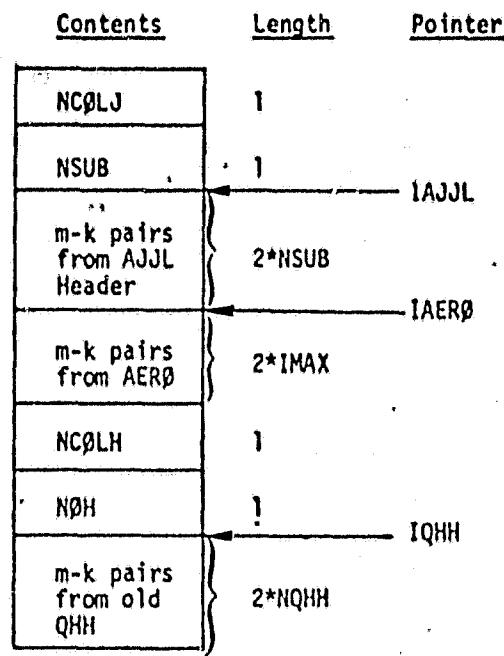
QHHLØ and QJHLØ are the GINØ file numbers of two scratch files to hold valid submatrices from QHHL and QJHL on restart.

INDEX is the GINØ file number of the scenario data block. Its contents are as follows:

<u>Record No.</u>	<u>Word</u>	<u>Contents</u>
0	1	Header
1	1	M column number
	2	K column number
3		AJJL column number
4		QHHLØ column number (0 implies recompute)
...		

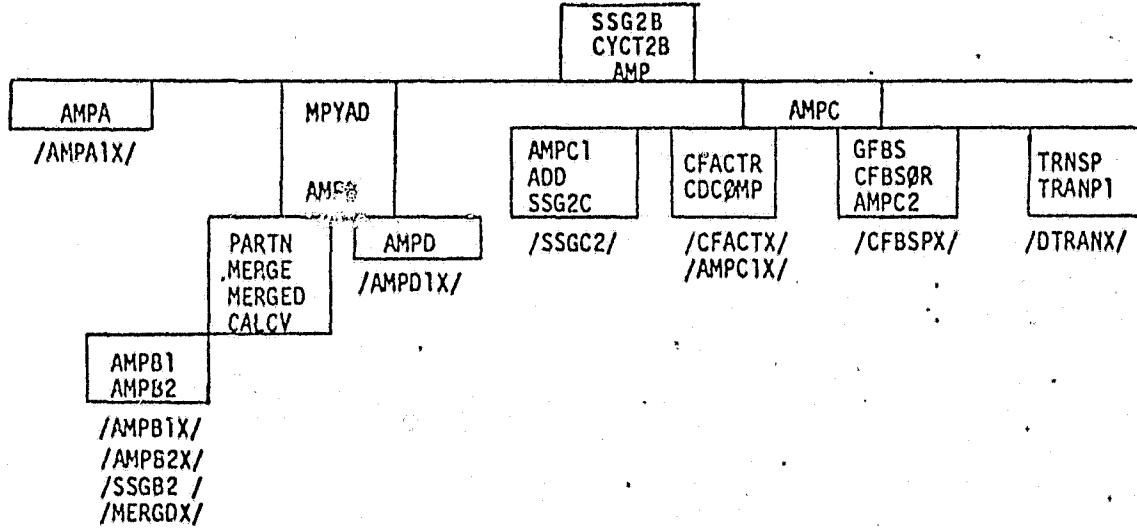
FUNCTIONAL MODULE AMP (AERODYNAMIC MATRIX PROCESSOR)

Open core AMPA1X is laid out as follows:



2 Buffers

3. Overlay Considerations: To maximize open core, AMP could look as follows:



FUNCTIONAL MODULE FA2 (FLUTTER ANALYSIS - PHASE 2)

4.117 FUNCTIONAL MODULE FA2 (FLUTTER ANALYSIS - PHASE 2)

4.117.1 Entry Point: FA2

4.117.2 Purpose

To collect data for reduction and presentation for each loop through the configuration parameters.

4.117.3 DMAP Calling Sequence

```
FA2    PHIH,CLAMA,FSAVE / PHIHL,CLAMAL,CASEYY,ØVG / V,N,TSTART / C,Y,VREF  
      *1.0 / C,Y,PRINT=YES $
```

4.117.4 Input Data Blocks

PHIH - Complex eigenvectors - h set, modal formulations.

CLAMA - Complex eigenvalue output table.

FSAVE - Flutter storage save table.

Note: No input data block may be purged.

4.117.5 Output Data Blocks

PHIHL - Appended complex mode shapes - h set.

CLAMAL - Appended complex eigenvalue output table.

CASEYY - Appended case control data table.

ØVG - Output aeroelastic curve requests (V-g or V-f).

Notes:

1. No output data block may be purged.
2. All output data blocks are read (DMAP attribute APPEND) on subsequent calls (FLØØP from FSAVE ≠ 1).

4.117.6 Parameters

TSTART - Integer-input/output-no default value. On input TSTART is the CPU time at the start of the DMAP flutter loop. On output TSTART will be -1 if there is insufficient time for another DMAP loop.

VREF - Real-user input-default = 1.0. V_{out} will be scaled by VREF:

$$V_{out} = V/V_{ref}$$

PRINT - BCD-user input-default = YES. If PRINT = NO, no flutter summary
will be printed.

For YES the wing flutter summary will be printed.

For YESB the blade summary will be printed.

MODULE FUNCTIONAL DESCRIPTIONS

4.117.7 Method

The primary purpose of module FA2 is to gather data for reduction and presentation. The header record of FSAVE will contain the METHOD. Only the k-method is defined. This module is near the end of a DMAP loop. Its output files PHIHL, CLAMAL, CASEYY AND ØVG are appended for each entry. On the first pass, special code must be executed to initiate the files.

The complex eigenvalues λ have been found by module CEAD. These should have been sorted by $\text{Im}(\lambda)$ increasing. Only use the first "NVALUE" modes. The quantitites that need to be computed are:

MACH can be interblade

phase angle SIGMA for

$$V_{\text{out}} = \text{Im}(\lambda)/V_{\text{ref}}$$

compressor blade flutter

analysis.

$$g = \begin{cases} (2.0) \text{Re}(\lambda)/\text{Im}(\lambda) & \text{if } \text{Im}(\lambda) \neq 0 \\ 0 & \text{if } \text{Im}(\lambda) = 0 \end{cases}$$

$$f = k \text{Im}(\lambda)/2\pi b_{\text{ref}}$$

$$V_{\text{mach}} = V_{\text{sound}} m/V_{\text{ref}}$$

The values of the parameter FLØØP, m, k, b_{ref} and NVALUE are found in the file FSAVE. A printer output is prepared the format is:

FLUTTER SUMMARY (K METHOD)

LØØP	DENRATIØ	KFREQ	1./KFREQ	MACH	MACH*VSOUND	VEL(K)	G(DAMP)	FREQ
I	R	R	R	R	R	R	R	R
FLØØP	p	K	1./K	m	M*V _{sound}	V _{out}	g	f

The PHIHL, CASEYY and CLAMAL data blocks are created by appending the PHIHL, CASEYY and CLAMAL data blocks. (Note: Some method of mode selection is expected to be added here. At present, we will rely upon ALLMAT to select vectors.)

The CASEYY data block is for SDR2 and PLØT. It must keep in step with the append vectors. m, k, p and FLØØP will be added to the TABL

FUNCTIONAL MODULE FA2 (FLUTTER ANALYSIS - PHASE 2)

The ØVG data block is appended each time through the LØØP. This will be used to create V-g or V-f plots. m, k, p and FLØØP will be added to the LABEL.

4.117.8 Subroutines

Utility routine CYCT2B is called.

4.117.9 Design Requirements

Open core for FA2 is at /FA2X/.

4.117.10 Diagnostic Messages

The following messages may occur: 3001, 3002, 3003, 3007, 3008 and 3045. Only 3045 is a user message. It indicates that the DMAP loop was not completed by exhausting the configuration parameters but rather by a time-to-go failure.

RIGID FORMAT RESTART TABLES

Displacement Approach Rigid Formats

<u>Solution Number</u>	<u>Rigid Format Name</u>	<u>Section</u>
1	STATICS	10.2
2	INERTIA RELIEF	10.3
3	MØDES or NØRMAL MØDES or REAL EIGENVALUES	10.4
4	DIFFERENTIAL STIFFNESS	10.5
5	BUCKLING	10.6
6	PIECEWISE LINEAR	10.7
7	DIRECT COMPLEX EIGENVALUES	10.8
8	DIRECT FREQUENCY RESPONSE	10.9
9	DIRECT TRANSIENT RESPONSE	10.10
10	MØDAL COMPLEX EIGENVALUES	10.11
11	MØDAL FREQUENCY RESPONSE	10.12
12	MØDAL TRANSIENT RESPONSE	10.13
13	NØRMAL MØDES ANALYSIS WITH DIFFERENTIAL STIFFNESS	10.14
14	STATICS CYCLIC SYMMETRY	10.15
15	MØDES CYCLIC SYMMETRY	10.16
16	STATIC AEROTHERMOELASTIC ANALYSIS WITH DIFFERENTIAL STIFFNESS	10.21

Heat Transfer Approach Rigid Formats

<u>Solution Number</u>	<u>Rigid Format Name</u>	<u>Section</u>
1	STATICS	10.17
3	STEADY STATE	10.18
9	TRANSIENT	10.19

Aeroelastic Approach Rigid Format

<u>Solution Number</u>	<u>Rigid Format Name</u>	<u>Section</u>
9	COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS	10.22
10	MODAL FLUTTER ANALYSIS	10.20

Table 1. Rigid Format Index Table

STATIC AEROELASTIC ANALYSIS

10.21 RESTART TABLES FOR STATIC AEROELASTIC ANALYSIS

10.21.1 Bit Positions for Card Name Restart Table

Card Name	Bit Pos.	Card Name	Bit Pos.	Card Name	Bit Pos.
AIXC	1	CQDPLT	2	PELAS	6
AXIF	1	CQUADI	2	PHASS	7
CELASI	1	CQUAD2	2	MAT1	8
CELAS2	1	CQUADTS	2	MAT2	8
CELAS3	1	CRD0	2	MAT3	8
CELAS4	1	CSHEAR	2	MATT1	8
CHASS1	1	CTETRA	2	MATT2	8
CHASS2	1	CTORDRG	2	MATT3	8
CHASS3	1	CTRAPAX	2	TABLEM1	8
CHASS4	1	CTRAPRG	2	TABLEM2	8
CORD1C	1	CTRBSCL	2	TABLEM3	8
CORD1R	1	CTRIA1	2	TABLEM4	8
CORD1S	1	CTRIA2	2	TEMPMTS	8
CORD2C	1	CTRIAAX	2	TEMPMXS	8
CORD2R	1	CTRIAARG	2	AXISYMS	9
CORD2S	1	CTRIAATS	2	CRIG01	9
GRDSET	1	CTRMEM	2	CRIG02	9
GRID	1	CTRPLT	2	MPC	9
GRIDB	1	CTUBE	2	MPCADD	9
POINTAX	1	CTWIST	2	MPCAX	9
RINGAX	1	CWEDGE	2	MPCS	9
RINGFL	1	PBAR	3	SPC	10
SECTAX	1	PCONEAX	3	SPC1	10
SEQGP	1	PDUM1	3	SPCADD	10
SPCINT	1	PDUM2	3	SPCAX	10
ADUM1	2	PDUM3	3	SPCS	10
ADUM2	2	PDUM4	3	ASET	11
ADUM3	2	PDUM5	3	ASET1	11
ADUM4	2	PDUM6	3	OMIT	11
ADUM5	2	PDUM7	3	OMIT1	11
ADUM6	2	PDUM8	3	OMITAX	11
ADUM7	2	PDUM9	3	SUPAX	12
ADUM8	2	PIHEX	3	SUPORT	12
ADUM9	2	PQDMEM	3	TEMP	13
BAROR	2	PQDMEM1	3	TEMPAX	13
CBAR	2	PQDMEM2	3	TEMPO	13
CCONEAX	2	PQDMEM3	3	TEMPP1	13
CDUM1	2	PQDPLT	3	TEMPP2	13
CDUM2	2	PQUADI	3	TEMPP3	13
CDUM3	2	PQUAD2	3	TEMPPR	13
CDUM4	2	PQUADTS	3	WTHASS	14
CDUM5	2	PROD	3	GROPN	15
CDUM6	2	PSHEAR,	3	PLOTEL	16
CDUM7	2	PTORDRG	3	IRES	17
CDUM8	2	PTRAPAX	3	PLOTS	18
CDUM9	2	PTRBSC	3	POUTS	19
CHEXA1	2	PTRIAL	3	LOOPS	22
CHEXA2	2	PTRIAZ	3	LOOP1\$	23
CIHEX1	2	PTRIAAX	3	COUPHASS	24
CIHEX2	2	PTRIATS	3	CPBAR	24
CIHEX3	2	PTRMEM	3	CPQDPLT	24
CONROD	2	PTRPLT	3	CPQUADI	24
CQDMEM	2	PTUBE	3	CPQUAD2	24
CQDMEM1	2	PTWIST	3	CPROD	24
CQDMEM2	2	GENEL	4	CPTRBSC	24
CQDMEM3	2	CONML	5	CPTRIAL	24
		CONMZ	5		

RIGID FORMAT RESTART TABLES

Card Name Bit Pos.

CPTRIA2	24
CPTRPLT	24
CPTUBE	24
CSP\$	25
STREAM1	26
DTI	26
APRESS	26
ATEMP	26
SIGN	26
ZORIGN	26
FXCOOR	26
FYCOOR	26
FZCOOR	26
STREAML	27
PGEOM	27
KTOUT	28
DEFORM	59
DEFORM\$	59
LOADS	59
RFORCE\$	59
SPCD	59
FORCE	60
FORCE1	60
FORCE2	60
FORCEAX	60
LOAD	60
MOMAX	60
MOMENT	60
MOMENT1	60
MOMENT2	60
PLOAD	60
PLOAD1	60
PLOAD2	60
PLOAD3	60
PRESAX	60
SLOAD	60
GRAV	61
RFORCE	61
TEMPLD\$	62

STATIC AEROELASTIC ANALYSIS

10.21.2 Bit Positions for File Name Restart Table

File Name	Bit Pos.	File Name	Bit Pos.
BGPDT	94	PG1	111
CSTM	94	QG	111
EQEXIN	94	UGV	111
GPDY	94	OEF1	112
GPL	94	OES1	112
SIL	94	OPGL	112
ECT	95	OQG1	112
GPTT	96	OUGV1	112
SLT	96	PUGV1	112
EST	97	KDDICT	113
GEI	97	KDELM	113
GPECT	97	KDGG	113
GPST	98	KDNN	114
KGGX	98	KDFF	115
MGG	99	KDFS	115
KGG	100	KDSS	115
RG	101	KDAA	116
USET	101	KBLL	117
YS	101	KBFS	117
DGPST	102	KBSS	117
GM	103	PBL	117
KNN	104	PBS	117
KFF	105	YBS	117
KFS	105	LBL	118
KSS	105	UBLV	119
GO	106	RUBLV	119
KAA	106	QBG	120
KOO	106	UBGV	120
LOO	106	OEFBI	121
LLL	107	OESBI	121
PG	108	OQBGI	121
PL	109	OUBGV1	121
PO	109	PUBGV1	121
PS	109	ELSETS	122
RULV	110	GPSETS	122
RUOV	110	PLTPAR	122
ULV	110	PLTSETX	122
UOOV	110	KDICT	123
		KELM	123
		MDICT	123
		MELM	123
		CASECCA1	124
		GEOM3A1	124
		SLTA1	125
		GPTTA1	125
		PGA1	126
		CASECCA	127
		GEOM3A	127
		SLTA	128
		GPTTA	128
		PGA	129
		FCE	134
		GEOM3B	131
		PGNA	132
		AUGV	133
		PGI2	134

RIGID FORMAT RESTART TABLES

10.21.3 Card Name Restart Table

DMP Inst.	1	10	20	Bit Position	30	40	50	60
BEGIN	1234567890	123456789		234				9012
GP1	1							
SAVE	1							
COND	1							
CHKPNT	1							
\$SS		6						
GP2	12 45		6					
CHKPNT	12 45		6					
\$SS		6						
PARAML		7		8				
\$SS		7		8				
PARAMP		7		8				
PURGE		7		8				
\$SS		7		8				
COND		7		8				
\$SS		7		8				
PLTSET		7		8				
\$SS		7		8				
SAVE		7		8				
\$SS		7		8				
PRTMSG		7		8				
\$SS		7		8				
PARAM		7		8				
\$SS		7		8				
PARAM		7		8				
\$SS		7		8				
COND		7		8				
\$SS		7		8				
PLOT		7		8				
\$SS		7		8				
SAVE		7		8				
\$SS		7		8				
PRTMSG		7		8				
\$SS		7		8				
LABEL		7		8				
\$SS		7		8				
CHKPNT		67		8				
\$SS		67		8				
GP3	12		3					01
SAVE	12		3					01
PARAM	12		3	5				01
CHKPNT	12		3					01
\$SS		6						
TAL	1234567		3					
SAVE	1234567		3					
COND	12345678		3					
PURGE	1234567		3					
CHKPNT	1234567		3					
\$SS		6						
PARAM	1234 6							
EMG	12345678							

STATIC AEROELASTIC ANALYSIS

DMP Inst.	1	10	20	<u>Bit Position</u>	30	40	50	60
SAVE	12345678							
CHKPNT	12345678	6						
\$SS								
COND	1234	6 8						
EMA	1234	6 8						
CHKPNT	1234	6 8						
\$SS		6						
LABEL	12345	78	4		4			
COND	12345	78	4		4			
EMA	12345	78	4		4			
CHKPNT	12345	78	4		4			
\$SS		6						
LABEL	12345	78	4		4			
COND	123	5 78	45		4			
\$SS		13						
COND	123	5 78	45		4			
\$SS		8						
GPHG	123	5 78	45		4			
\$SS		8						
QFP	123	5 78	45		4			
\$SS		8						
LABEL	123	5 78	45		4			
\$SS		8						
EQUIV	1234	6 8						
CHKPNT	1234	6 8						
\$SS		6						
COND	1234	6 8						
SMA3	1234	6 8						
CHKPNT	1234	6 8						
\$SS		6						
LABEL	1234	6 8						
PARAM	1		901					
GP4	1		901					
SAVE	1		901					
COND	1		901					
PURGE	1		901					
CHKPNT	1234	6 8901						
\$SS		6						
COND	1		2					
JUMP	1		2					
LABEL	1		2					
COND	123	6 890						
GPSP	123	6 890						
SAVE	123	6 890						
COND	123	6 890						
QFP	123	6 890						
LABEL	123	6 890						
EQUIV	1234	6 89						
CHKPNT	1234	6 89						
\$SS		6						
COND	1234	6 89						

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RIGID FORMAT RESTART TABLES

DMP Inst.	1	10	20	Bit Position	30	40	50	60
MCE1	1	9						
CHKPNT	1	9						
\$SS	6							
MCE2	1234	6 89						
CHKPNT	1234	6 89						
\$SS	6							
LABEL	1234	6 89						
EQUIV	1234	6 890						
CHKPNT	1234	6 890						
\$SS	6							
COND	1234	6 890						
SCE1	1234	6 890						
CHKPNT	1234	6 890						
\$SS	6							
LABEL	1234	6 890						
EQUIV	1234	6 8901						
CHKPNT	1234	6 8901						
\$SS	6							
COND	1234	6 8901						
SMP1	1234	6 8901						
CHKPNT	1234	6 8901						
\$SS	6							
LABEL	1234	6 8901						
RBMG2	1234	6 8901						
CHKPNT	1234	6 8901						
\$SS	6							
SSG1	123	5678	3				9012	
CHKPNT	123	5678	3				9012	
\$SS	6							
PARAM	123	5678	3		6		9012	
COND	123	5678	3		6		9012	
ALG	123	5678	3		67		9012	
COND	123	5678	3		6		9012	
PARAM	123	5678	3		6		9012	
COND	123	5678	3		6		9012	
GP3	123	5678	3		6		9012	
CHKPNT	123	5678	3		6		9012	
\$SS	6							
SSG1	123	5678	3		6		9012	
CHKPNT	123	5678	3		6		9012	
\$SS	6							
ADD	123	5678	3		6		9012	
LABEL	123	5678	3		6		9012	
EQUIV	123	5678	3		6		9012	
CHKPNT	123	5678	3		6		9012	
\$SS	6							
EQUIV	123	5678901	3		6		9012	
CHKPNT	123	5678901	3		6		9012	
\$SS	6							
COND	123	5678901	3		6		9012	
SSG2	123	5678901	3		6		9012	

STATIC AEROELASTIC ANALYSIS

DMAP		Bit Position						
Inst.		1	10	20	30	40	50	60
CHKPNT	123 5678901	3		6				9012
SSS	6			6				
LABEL	123 5678901	3		6				9012
SG3	12345678901	3		6				9012
SAVE	12345678901	3		6				9012
CHKPNT	12345678901	3		6				9012
SSS	6			6				
COND	12345678901	3	7	6				9012
MATGPR	12345678901	3	7	6				9012
MATGPR	12345678901	3	7	6				9012
LABEL	12345678901	3	7	6				9012
SDR1	12345678901	3		6				9012
CHKPNT	12345678901	3		6				9012
SSS	6			9				
SDR2				9				
PARAM				9				
OFF				9				
SAVE				9				
COND				8				
SSS		7		8				
PLOT		7		8				
SSS		7		8				
SAVE		7		8				
SSS		7		8				
PRTMSG		7		8				
SSS		7		8				
LABEL				8				
SSS		7						
TA1	12345678901			6				9012
DSMG1	12345678901			6				9012
CHKPNT	12345678901			6				9012
SSS	6							
COND	123 5678	3		6				9012
EQUIV	123 5678	3		6				9012
LABEL	123 5678	3		6				9012
PARAM	12345678901			6				9012
PARAM	12345678901			6				9012
PARAMR	12345678901			6				9012
PARAML	12345678901			6				9012
JUMP	12345678901			6				9012
LABEL	12345678901			6				9012
EQUIV	12345678901			6				9012
CHKPNT	12345678901			6				9012
SSS	6							
PARAM	12345678901			6				9012
EQUIV	12345678901			6				9012
CHKPNT	12345678901			6				9012
SSS	6							
COND	12345678901			6				9012
HCE2	12345678901			6				9012
CHKPNT	12345678901			6				9012

RIGID FORMAT RESTART TABLES

DMAP Inst.	1	10	Bit Position					
			20	30	40	50	60	
\$SS		6						
LABEL	12345678901		6					9012
EQUIV	12345678901		6					9012
CHKPNT	12345678901		6					9012
\$SS		6						
COND	12345678901		6					9012
SCPL	12345678901		6					9012
CHKPNT	12345678901		6					9012
\$SS		6						
LABEL	12345678901		6					9012
EQUIV	12345678901		6					9012
CHKPNT	12345678901		6					9012
\$SS		6						
COND	12345678901		6					9012
SMP2	12345678901		6					9012
CHKPNT	12345678901		6					9012
\$SS		6						
LABEL	12345678901		6					9012
ADD	12345678901		6					9012
ADD	12345678901		6					9012
ADD	12345678901		6					9012
COND	12345678901		6					9012
MPYAD	12345678901		6					9012
MPYAD	12345678901		6					9012
UMERGE	12345678901		6					9012
EQUIV	12345678901		6					9012
COND	12345678901		6					9012
UMERGE	12345678901		6					9012
LABEL	12345678901		6					9012
ADD	12345678901		6					9012
EQUIV	12345678901		6					9012
LABEL	12345678901		6					9012
ADD	12345678901		6					9012
COPY	12345678901		6					9012
RB4G2	12345678901	23	6					9012
SAVF	12345678901	23	6					9012
CHKPNT	12345678901	23	6					9012
\$SS		6						
PRTPARM	12345678901	23	6					9012
PRTPARM	12345678901	23	6					9012
JUMP	12345678901	23	6					9012
LABEL	12345678901	23	6					9012
PARAM	12345678901	23	6					9012
COND	12345678901	23	6					9012
ALG	12345678901	23	67					9012
COND	12345678901	23	6					9012
PARAM	12345678901	23	6					9012
PARAM	12345678901	23	6					9012
COND	12345678901	23	6					9012
GP3	12345678901	23	6					9012
SSG1	12345678901	23	6					9012

STATIC AEROELASTIC ANALYSIS

DMAP Inst.	1	10	Bit Position			40	50	60
			20	30				
ADD	12345678901		23	6				9012
LABEL	12345678901		23	6				9012
EQUIV	12345678901		23	6				9012
CHKPNT	12345678901		23	6				9012
SSS	6							
SSG2	12345678901		23	6				9012
SSG3	12345678901		23	6				9012
SAVF	12345678901		23	6				9012
CHKPNT	12345678901		23	6				9012
SSS	6							
COND	12345678901	7	23	6				9012
MATGPR	12345678901	7	23	6				9012
LABEL	12345678901	7	23	6				9012
SDR 1	12345678901		23	6				9012
CHKPNT	12345678901		23	6				9012
SSS	6							
COND	12345678901		23	6				9012
EQUIV	12345678901		23	6				9012
LABEL	12345678901		23	6				9012
ADD	12345678901		23	6				9012
DSMGI	12345678901		23	6				9012
CHKPNT	12345678901		23	6				9012
SSS	6							
MPYAD	12345678901		23	6				9012
ADD	12345678901		23	6				9012
DSCHK	12345678901		23	6				9012
SAVE	12345678901		23	6				9012
COND	12345678901		23	6				9012
COND	12345678901		23	6				9012
EQUIV	12345678901		23	6				9012
EQUIV	12345678901		23	6				9012
EQUIV	12345678901		23	6				9012
REPT	12345678901		23	6				9012
TABPT	12345678901		23	6				9012
LABEL	12345678901		23	6				9012
ADD	12345678901		23	6				9012
CHKPNT	12345678901	7,3	6					9012
SSS	6							
EQUIV	12345678901		23	6				9012
CHKPNT	12345678901		23	6				9012
SSS	6							
EQUIV	12345678901		23	6				9012
REPT	12345678901		23	6				9012
TABPT	12345678901		23	6				9012
LABEL	12345678901		23	6				9012
PARAM	12345678901		23	6	8			9012
COND	12345678901		23	6	8			9012
ADD	12345678901		23	6	8			9012
OUTPUT1	12345678901		23	6	8			9012
OUTPUT1	12345678901		23	6	8			9012
LABEL	12345678901		23	6	8			9012

RIGID FORMAT RESTART TABLES

DMAP Inst.	1	10	20	Bit Position	30	40	50	60
CHKPNT				9				
\$SS	6				23	67		
ALG	12345678901		89					9012
SDR 2			9					
DFP			9					
SAVE			9					
SDR 1	12345678901		23	6				9012
GPFEGR	12345678901		23	6				9012
DFP	12345678901		23	6				9012
COND			8					
\$SS	7		8					
PLUT			8					
\$SS	7		8					
SAVE			8					
\$SS	7		8					
PRTMSG			8					
\$SS	7		8					
LABEL			8					
\$SS	7		8					
JUMP	12345678901	123456789	234					9012
LABEL	12345678901	123456789	234					9012
PRTPARM	12345678901	123456789	234					9012
LABEL	12345678901	123456789	234					9012
PRTPARM	12345678901	123456789	234					9012
LABEL	12345678901	123456789	234					9012
PRTPARM	12345678901	123456789	234					9012
\$SS	8		8					
LABEL	12345678901	123456789	234					9012
\$SS	8		8					
PRTPARM	12345678901	123456789	234					9012
LABEL	12345678901	123456789	234					9012
END	12345678901	123456789	234					9012

STATIC AEROELASTIC ANALYSIS

10.21.4 Rigid Format Change Restart Table

Inst.	<u>Bit Position</u>	
	63	70
		80
BEGIN	345	78901234567
GP1		345
SAVE		
COND		
CHKPNT		
GP2		
CHKPNT		
PARAML		
PARAMR		
PURGE		
COND		
PLTSET		
SAVE		
PRTMSG		
PARAM		
PARAM		
COND		
PLOT		
SAVE		
PRTMSG		
LABEL		
CHKPNT		
GP3		
SAVE		
PARAM	345	78901234567
CHKPNT		345
TAL		
SAVE		
COND	345	78901234567
PURGE		345
CHKPNT		
PARAM		
EMG		
SAVE		
CHKPNT		
COND		
EMA		
CHKPNT		
LABEL		
COND		
EMA		
CHKPNT		
LABEL		
COND		
COND		
IPWG		
DFP		
LABEL		
EQUIV		
CHKPNT		
COND		

RIGID FORMAT RESTART TABLES

DMAP Inst.	63	<u>Bit Position</u>	70	80
SMA3				
CHKPNT				
LABEL				
PARAM				
GP4				
SAVE				
COND	345	901234567		345
PURGE				
CHKPNT				
COND	345	901234567		345
JUMP	345	901234567		345
LABEL	345	901234567		345
COND				
GSP				
SAVE				
COND				
GFP				
LABEL				
EQUIV				
CHKPNT				
COND				
MCF1				
CHKPNT				
HCE2				
CHKPNT				
LABEL				
EQUIV				
CHKPNT				
COND				
SCE1				
CHKPNT				
LABEL				
EQUIV				
CHKPNT				
COND				
SMP1				
CHKPNT				
LABEL				
RBMG2				
CHKPNT				
SSG1				
CHKPNT				
PARAM				
COND				
ALG				
COND				
PARAM				
COND				
GP3				
CHKPNT				
SSG1				

STATIC AEROELASTIC ANALYSIS

Inst.	63	<u>Bit Position</u>	70	80
CHKPNT				
ADD				
LABEL				
EQUIV				
CHKPNT				
EQUIV				
CHKPNT				
COND				
SSG2				
CHKPNT				
LABEL				
SSG3		4		
SAVE		4		
CHKPNT		4		
COVD	45	8901234567	345	
MATGPR	45	8901234567	345	
MATGPR	45	8901234567	345	
LABEL	45	8901234567	345	
SDR1				
CHKPNT				
SDR2				
PARAM				
OFP				
SAVE				
COND				
PLOT				
SAVE				
PRTMSG				
LABEL				
TA1				
DSMGI				
CHKPNT				
COND				
EQUIV				
LABEL				
PARAM				
PARAM				
PARAMR				
PARAML				
JUMP				
LABEL				
FQIV				
CHKPNT				
PARAM				
EQUIV				
CHKPNT				
COVD				
MCE2				
CHKPNT				
LABEL				
EQUIV				

RIGID FORMAT RESTART TABLES

DMAP	Inst.	Bit Position
		63 70 80
CHKPNT		
COPY		
SCE1		
CHKPNT		
LABEL		
EQUIV		
CHKPNT		
COND		
SMP2		
CHKPNT		
LABEL		
ADD		
ADD		
ADD		
COND		
MPLYAD		
MPLYAD		
UMERGE		
EQUIV		
COND		
UMERGE		
LABEL		
ADD		
EQUIV		
LABEL		
ADD		
COPY		
RBMG2		
SAVE		
CHKPNT		
PRTPARM		
PRTPARM		
JUMP		
LABEL		
PARAM		
COND		
ALG		
COND		
PARAM		
PARAM		
COND		
GP3		
SSG1		
ADD		
LABEL		
EQUIV		
CHKPNT		
SSG2		
SSG3		
SAVE		
CHKPNT		

STATIC AEROELASTIC ANALYSIS

DMAP	Bit Position		
Inst.	63	70	80
COND			
MATGPR			
LABEL			
SDR 1	345	78901234567	345
CHKPNT	345	78901234567	345
COND			
EQUIV			
LABEL			
ADD			
DS4G1			
CHKPNT			
MPYAD			
ADD			
DSCHK			
SAVE			
COVD			
COND			
EQUIV			
EQUIV			
EQUIV			
REPT			
TABPT			
LABEL			
ADD			
CHKPNT			
EQUIV			
CHKPNT			
EQUIV			
REPT			
TABPT			
LABEL			
PARAM			
COVD			
ADD			
OUTPUT1			
OUTPUT1			
LABEL			
CHKPNT			
ALG			
SDR 2			
DFP			
SAVE			
SDR 1			
GPFOR			
DFP			
COND			
PLOT			
SAVE			
PRTMSG			
LABEL			
JUMP	345	78901234567	345

RIGID FORMAT RESTART TABLES

DMAP Int.	63	<u>Bit Position</u>	80
LABEL	345	78901234567	345
PRTPARM	345	78901234567	345
LABEL	345	78901234567	345
PRTPARM	345	78901234567	345
LABEL	345	78901234567	345
PRTPARM	345	78901234567	345
LABFL	345	78901234567	345
PRTPARM	345	78901234567	345
LABEL	345	78901234567	345
END	345	78901234567	345

STATIC AEROELASTIC ANALYSIS

10.21.5 File Name Restart Table

			<u>Bit Position</u>				
			110	120	130	140	150
BEGIN							
GP1	4						
SAVE	4						
COND	4						
CHKPNT	4						
GP2	5						
CHKPNT	5						
PARAML				2			
PARAMR				7			
PURGE					2		
COND					2		
PLTSET					2		
SAVE					2		
PRTMSG					2		
PARAM					2		
PARAM					2		
COND							
PLOT							
SAVE							
PRTMSG							
LABEL							
CHKPNT					2		
GP3	6						
SAVE	6						
PARAM	6	9					
CHKPNT	6						
TAI	7						
SAVE	7						
COND	7	9					
PURGE	7		2				
CHKPNT	7						
PARAM	8						
EMG				3			
SAVE				3			
CHKPNT				3			
COND		8					
EMA		8					
CHKPNT		8					
LABEL		8					
COND		9					
EMA		9					
CHKPNT		9					
LABEL		9					
COND							
COND							
GPHG							
DFP							
LABEL	7	9					
EQUIV	0						
CHKPNT	0						
COND	0						

RIGID FORMAT RESTART TABLES

DMAP Inst.	94	100	Bit Position			130	140	150
			110	120				
SMA3		0						
CHKPNT		0						
LABEL		0						
PARAM		1						
GP4		1						
SAVE		1						
COND		1						
PURGE	1	3 56	901	5 7				
CHKPNT	1	3 56	901	5 7				
COND								
JUMP								
LABEL								
COND		2						
GPSP		2						
SAVF		2						
COND		2						
DFP		2						
LABEL		2						
EQUIV		4						
CHKPNT		4						
COND		34						
MCE1		3						
CHKPNT		3						
MCF2		4						
CHKPNT		4						
LABEL		34						
EQUIV		5						
CHKPNT		5						
COND		5						
SCE1		5						
CHKPNT		5						
LABEL		5						
EQUIV		6						
CHKPNT		6						
COND		6						
SMP1		6						
CHKPNT		6						
LABEL		6						
PRMG2		7						
CHKPNT		7						
SSG1						2		
CHKPNT						2		
PARAM						4		
COND						4		
ALG						4		
COND						5		
PARAM						5		
COND						5		
GP3						5		
CHKPNT						5		
SSG1						6		

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STATIC AEROELASTIC ANALYSIS

Inst.	94	100	Bit Position				
			110	120	130	140	150
CHKPNT							6
ADD			8				
LABFL			8				
EQUIV			8				
CHKPNT			8				
EQUIV			9				
CHKPNT			9				
COND			9				
SSG2			9				
CHKPNT			9				
LABEL			9				
SSG3			0				
SAVE			0				
CHKPNT			0				
COND							
MATGPR							
MATGPR							
LABEL							
SDR1			1				
CHKPNT			1				
SDR2			2				
PARAM							
DFP							
SAVE							
COND							
PLDT							
SAVE							
PRTMSG							
LABFL							
TA1			3				
DSVG1			3				
CHKPNT			3				
COND							
EQUIV							
LABEL							
PARAM							
PARAM							
PARAMR							
PARAML							
JUMP							
LABEL							
EQUIV			4				
CHKPNT			4				
PARAM			4				
EQUIV			4				
CHKPNT			4				
COND			4				
MCF2			4				
CHKPNT			4				
LABEL			4				
EQUIV			5				

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RIGID FORMAT RESTART TABLES

DMAP Inst.	94	100	Bit Position				
			110	120	130	140	150
CHKPNT			5				
COPY			5				
SCE1			5				
CHKPNT			5				
LABEL			5				
EQUIV			6				
CHKPNT			6				
COPY			6				
SMP 2			6				
CHKPNT			6				
LABEL			6				
ADD			7				
ADD			7				
ADD			7				
COND							
MPYAD							
MPYAD							
UMERGE							
EQUIV							
COPY							
UMERGE							
LABEL							
ADD							
EQUIV							
LABEL							
ADD							
COPY							
R84G2			8				
SAVE			8				
CHKPNT			8				
PRTPARM			8				
PRTPARM			8				
JUMP							
LABEL							
PARAM							
COND							
ALG							
COND							
PARAM							
PARAM							
COND					890		
GP3					8		
SSG1					9		
ADD					0		
LABEL							
EQUIV							
CHKPNT					0		
SSG2							
SSG3							
SAVE							
CHKPNT							

STATIC AEROELASTIC ANALYSIS

DMAP	Inst.	94	100	Bit Position	110	120	130	140	150
COND									
MATGPR									
LABEL							0		
SDR1							0		
CHKPNT									
COND									
EQUIV									
LABEL									
ADD									
DSMGL									
CHKPNT									
MPYAD									
ADD									
DSCHK									
SAVE									
COND									
COND									
EQUIV									
EQUIV									
EQUIV									
REPT									
TABPT									
LABEL									
ADD									
CHKPNT									
EQUIV									
CHKPNT									
EQUIV									
REPT									
TABPT									
LABEL									
PARAM									
COND									
ADD									
OUTPUTI									
OUTPUTI									
LABEL									
CHKPNT									
ALG									
SDR2									
OFP									
SAVE									
SDR1									
GFFOR									
OFP									
COND									
PLOT									
SAVE									
PRTMSG									
LABEL									
JUMP									

RIGID FORMAT RESTART TABLES

DMAP Inst.	94	100	Bit Position			
			110	120	130	140
LABEL						
PRTPARM						
LABEL						
PRTPARM						
LABEL						
PRTPARM						
LABEL						
PRTPARM						
LABEL						
END						

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

10.22 RESTART TABLES FOR COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

10.22.1 Bit Positions for Card Name Restart Table

Card Name	Bit Pos.	Card Name	Bit Pos.	Card Name	Bit Pos.
ADUM1	1	CQDPLT	2	MAT2	8
ADUM2	1	CQUAD1	2	MAT3	8
ADUM3	2	CQUAD2	2	MATT1	8
ADUM4	3	CQUADTS	2	MATT2	8
ADUM5	4	CKOD	2	MATT3	8
ADUM6	1	CSHEAR	2	TABLEM1	8
ADUM7	1	CTEIRA	2	TABLEM2	9
ADUM8	1	CTORDRG	2	TABLEM3	8
ADUM9	1	CTRAPAX	2	TABLEM4	8
AIXC	1	CTRAPRNG	2	TEMPMTS	8
AIXF	1	CTRDBSC	2	TEMPMXS	8
CELASI	1	CTRIAL	2	AXISYM	9
CELAS2	1	CTRIA2	2	CRIGD1	9
CELAS3	1	CTRIAAX	2	CRIGD2	9
CELAS4	1	CTRIARG	2	MPC	9
CMASS1	1	CTRIATS	2	MPCADD	9
CMASS2	1	CTRHEM	2	MPC&	9
CMASS3	1	CTRPLT	2	MPCAX	9
CMASS4	1	CTUBE	2	SPC	10
CORD1C	1	CTWIST	2	SPC1	10
CORD1R	1	CWEDGE	2	SPCAADD	10
CORD1S	1	PBAR	3	SPCAKX	10
CORD2C	1	PCONEAX	3	SPCB	10
CORD2R	1	PDUM1	3	ASET	11
CORD2S	1	PDUM2	3	ASET1	11
GRDSET	1	PDUM3	3	OMIT	11
GRID	1	PDUM4	3	OMIT1	11
GRIDB	1	PDUM5	3	OMITAX	11
POINTAX	1	PDUM6	3	SUPAX	12
RINGAX	1	PDUM7	3	SUPORT	12
RINGFL	1	PDUM8	3	TEMP	13
SEGTAX	1	PDUM9	3	TEMPAX	13
SEQGP	1	PIHEX	3	TEMPD	13
SPOINT	1	PQDHEN	3	TEMPP1	13
DAROR	2	PQDPLT	3	TEMPP2	13
CBAR	2	PQUADL	3	TEMPP3	13
CCONEAX	2	PQUAD2	3	TEMPPR	13
CDUM1	2	PQUADTS	5	GROPN	15
CDUM2	2	PROD	3	PLOT	16
CDUM3	2	PSHEAR	3	PLOTS	18
CDUM4	2	PTORDRG	3	POUTS	19
CDUM5	2	PTRAPAX	3	XYOUTS	20
CDUM6	2	PTRDSC	3	AOUTS	21
CDUM7	2	PTRIAL	3	COUPHASS	24
CDUM8	2	PTRIA2	3	CPBAR	24
CDUM9	2	PTRIAAX	3	CPDPLT	24
CFLUID02	2	PTRIATS	3	CPQUAD1	24
CFLUID03	2	PTRHMEM	3	CPQUAD2	24
CFLUID04	2	PTRHPLT	3	CPROD	24
CHEXA1	2	PTUBE	3	CPTRBSC	24
CHEXA2	2	PTWIST	3	CPTRIAL	24
CIHEX1	2	GENCL	4	CPTRIA2	24
CIHEX2	2	CONN1	5	CPTRPLT	24
CISHEX3	2	CONN2	5	CPTUBE	24
CONROD	2	PELAS	6	WTMASS	24
CQDMEM	2	PIASS	7	NODJE	26
		MAT1	8	PAERO1	29

RIGID FORMAT RESTART TABLES

Card Name	Bit Pos.
-----------	----------

SET1	32
SET2	32
SPLINE1	32
SPLINE2	32
MKAERO1	34
MKAERO2	34
AFACT	35
FLFACT	36
FLUTTER	36
AERO	37
CAERO1	37
FMETHOD\$	38
VREF	39
TF	40
CYJOIN	41
CTYPE	41
NSEGS	41
KINDEX	41
CYCSEQ	42
STREAML1	42
STREAML2	42
IREF	42
MINMACH	42
MAXMACH	42
MTYPE	42
KGGIN	43
SDAMPS\$	55
TABDNP1	55
EPOINT	56
SEQEP	56
B2PP\$	57
DMIG	57
K2PP\$	57
M2PP\$	57
TF\$	57
EIGR	58
METHOD\$	59
EIGC	60
EIGP	60
CMETHOD\$	61
HFREQ	62
LFREQ	62
LMODES	62

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

10.22.2 Bit Positions for File Name Restart Table

File Name	Bit Pos.	File Name	Bit Pos.
BGPDT	94	KELM	
CSTM	94	MDUCT	122
EQEXIN	94	MELM	
GPDT	94	MAA	123
GPL	94	ACPT	124
SIL	94	AERO	124
ECT	95	BGPA	124
GPTT	96	CSTMA	124
EST	97	ECTA	124
GEI	97	EQAERO	124
GPECT	97	FLIST	124
GPST	98	GPLA	124
KGGX	98	SILA	124
MGG	99	SILGA	124
KGG	100	SPLINE	124
RG	101	USETA	124
USET	101	ELSESETSA	125
OGPST	102	GPSETSA	125
GM	103	PLTPARA	125
KNN	104	PLTSETA	125
MNN	104	GTKA	126
KFF	105	AJYL	127
KFS	105	D1JK	127
MFF	105	D2JK	127
KAA	106	SKJ	127
KLL	107	D1JE	128
KLR	107	D2JE	128
KRR	107	BXHH	129
MLL	107	KXHH	129
MLR	107	MXHH	129
MRR	107	FSAVE	129
LLL	108	CASEYY	130
DM	109	CLAMAL	130
MR	110	OVG	130
EED	111	PHIHL	130
EQDYN	111	CLAMAL1	131
GPLD	111	CPHIH1	131
SILD	111	CPHIA	132
TFPOOL	111	RP	132
USETD	111	CPHIK	133
LAMA	112	CPHIPS	134
MI	112	CPHIPA	136
OEIGS	112	QPAC	136
PHIA	112	OCPHIPA	137
GO	113	CEFC1	137
B2PP	114	OESC1	137
K2PP	114	OQPAC1	137
M2PP	114	PCPHIPA	137
GMD	115	QHHL	138
GOD	115	QJHL	138
BHH	116	B2DD	139
KHH	116	K2DD	139
MHH	116	M2DD	139
PHIDH	116	(YCD	140
CLAMA	117	YKK	141
OCEIGS	117	MKK	141
PHIH	117	PHIK	142
CPHID	118	LAMK	142
CPHIP	120	PHIG	143
QPC	120	PVECT	144
KDICT	122	PHIAK	145

RIGID FORMAT RESTART TABLES

10.22.3 Card Name Restart Table

DMAP Inst.	Bit Position						50	60
	1	10	20	30	40			
BEGIN	1234567890	123456	890	1234	6	9	2	4557890
FILF	1234567890	1234	9	1234	6	9	2	4567890
GP1	1							
SAVE	1							
COND	1							
CHKPNT	1							
\$\$\$	6							
PURGE								
GP2	12 45		6					
CHKPNT	12 45		6					
\$\$\$	6							
GP3	12		3					
CHKPNT	12		3					
\$\$\$	6							
TA1	1234567		3					
SAVE	1234567		3					
COND	1234567		34					
PURGE	1234567							
CHKPNT	1234567		3					
\$\$\$	6							
PARAM	123 6 8		3					
PARAM	123 5 78		34					
PARAM								
COND								
PARAM								
INPUTT1								
EQUIV								
CHKPNT								
\$\$\$	6							
LABEL								
EMG	123 5678		34					
SAVE	123 5678		34					
CHKPNT	123 5678		34					
\$\$\$	6							
COND	123 6 8		3					
EMA	123 6 8		3					
CHKPNT	123 6 8		3					
\$\$\$	6							
LABEL	123 6 8		3					
COND	123 5 78		34					
EMA	123 5 78		34					
CHKPNT	123 5 78		34					
\$\$\$	6							
COND	123 5 78		345					
GPHG	123 5 78		345					
OFF	123 5 78		345					
LABEL	123 5 78		345					
EQUIV	1234 6 8		3					
CHKPNT	1234 6 8		3					
\$\$\$	6							
COND	1234 6 8		3					

COMPRESSION BLADE CYCLIC MODAL FLUTTER ANALYSES

DMAP Inst.	1	10	20	<u>Bit Position</u>	30	40	50	60
SMA3	1234	6 8		3			3	
CHKPNT	1234	6 8		3			3	
\$SS	6							
LABEL	1234	6 8		3			3	
GP4	1			9012				
SAVE	1			9012				
PARAM	1			9012			3	
COND	1			9012			3	
PURGE	1			9012			3	
GPCYC	1		901				1	
SAVE	1		901				1	
CHKPNT	1		901				1	
\$SS	6							
COND	1		901				1	
COND	1234	6 890		3			3	
GP\$P	1234	6 890		3			3	
SAVF	1234	6 890		3			3	
COND	1234	6 890		3			3	
OFF	1234	6 890		3			3	
LABEL	1234	6 890		3			3	
EQUIV	123456789			4			3	
CHKPNT	123456789			4			3	
\$SS	6							
COND	123456789			34			3	
MCE1	1	9	3				3	
CHKPNT	1	9	3				3	
\$SS	6							
MCE2	123456789			34			3	
CHKPNT	123456789			34			3	
\$SS	6							
LABEL	123456789			34			3	
EQUIV	1234567890			34			3	
CHKPNT	1234567890			34			3	
\$SS	6							
COND	1234567890			34			3	
SCE1	1234567890			34			3	
CHKPNT	1234567890			34			3	
\$SS	6							
LABEL	1234567890			34			3	
EQUIV	12345678901			34			3	
CHKPNT	12345678901			34			3	
\$SS	6							
COND	12345678901			34			3	
SMP1	1234	6 8901	3				3	
CHKPNT	1234	6 8901	3				3	
\$SS	6							
SMP2	12345678901			34			4	
CHKPNT	12345678901			34			4	
\$SS	6							
LABEL	12345678901			34				
DPD	1		9012				0	
							6 8 0	

RIGID FORMAT RESTART TABLES

DMAP Inst.	1	10	20	<u>Bit Position</u>		40	50	60
				30	40			
SAVE	1	9012			0		6 8 0	
COND	1	9012			0		6 8 0	
EQUIV	1234567 9012 4		234			1 3	6 8	
CYCT2	12345678901					1 3	8	
SAVE	12345678901					1 3	8	
CHKPNT	12345678901					1 3	8	
\$SS	6							
COND	12345678901					1 3		
READ	12345678901234			4		1 3		89
SAVE	12345678901234			4		1 3		89
CHKPNT	12345678901234			4		1 3		89
\$SS	6							
PARAM	12345678901234			4		1 3		89
OFP	12345678901234			4		1 3		89
SAVE	12345678901234			4		1 3		89
COND	12345678901234			4		1 3		89
CYCT2	12345678901			4		1 3		89
SAVE	12345678901			4		1 3		89
CHKPNT	12345678901			4		1 3		89
\$SS	6							
COND	12345678901			4		1 3		89
SDR1	12345678901			4		1 3		89
SDR2			89					
OFP			9					
SAVE			9					
APDR	12 9012				4567	123		
SAVE	12 9012				4567	123		
CHKPNT	12 9012				4567	123		
\$SS	6							
PARTN	12 9012				4567	123		
SMPYAD	12 9012				4567	123		
MTRXIN	1		23			0		67
SAVE	1		23			0		67
PURGE	12 4		23			0		67
EQUIV	12 4 9 1		23			0		67
CHKPNT	12 4 9 1		23			0		67
\$SS	6							
GKAD	1234 6 8901 34		23			0123		67
CHKPNT	1234 6 8901 34		23			0123		67
\$SS	6							
GKAM	12345678901234		234			0123		56789 2
SAVE	12345678901234		234			0123		56789 2
CHKPNT	12345678901234		234			0123		56789 2
\$SS	6							
PARAML			8					
\$SS	7		8					
PURGE			8					
\$SS	7		8					
COND			8					
\$SS	7		8					
PLTSET			8					

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

DAMP Inst.	1	10	20	Bit Position	30	40	50	60
\$SS		7			8			
SAVE		7			8			
\$SS		7			8			
PRTMSG		7			8			
\$SS		7			8			
PARAM		8	0					
\$SS		7			8			
PARAM		8			8			
\$SS		7			8			
COND		7			8			
\$SS		7			8			
PLOT		8			8			
\$SS		7			8			
SAVE		7			8			
\$SS		7			8			
PRTMSG		7			8			
\$SS		7			8			
LABEL		7			8			
\$SS		7			8			
COND	1	9012				0		
PARAM	1				9	5		
AMG	1				9	7	23	
SAVE	1				9	45	23	
CHKPNT	1				9	45	23	
\$SS		6				7		
COND					6	7		
INPUTT2					6	7		
LABEL					6	7		
PARAM	1234567890123				4	9	2	5
AMP	1234567890123				4	9	2	5
SAVE	1234567890123				4	9	2	5
CHKPNT	1234567890123				4	9	2	5
\$SS	6				6	7	123	
PARAM			0		6	7	123	
PARAM			8		6	7	123	
PARAM			1		6	7	123	
PARAM	1234567890123				4	9	2	4567890
JUMP	1234567890123				4	9	2	4567890
LABEL	1234567890123				4	9	2	4567890
FA1	1234567890123				4	9	2	4567890123
SAVE	1234567890123				4	9	2	4567890123
CFAD	1234567890123				4	9	2	4567890123
SAVE	1234567890123				4	9	2	4567890123
COND	1234567890123				4	9	2	4567890123
COND			1		4	9	2	4567890123
VDR			1		4	9	2	4567890123
SAVE			1		4	9	2	4567890123
COND			1		4	9	2	4567890123
DFP			1		4	9	2	4567890123
SAVE			1		4	9	2	4567890123
LABEL			1		4	9	2	4567890123

RIGID FORMAT RESTART TABLES

DMAP Inst.	1	10	20	Bit Position			50	60
				30	40			
FA2	1234567890	123		4 6 9	2 4567890	123	567890	12
SAVE	1234567890	123		4 6 9	2 4567890	123	567890	12
CHKPNT	1234567890	123		4 6 9	2 4567890	123	567890	12
\$SS	6							
COND	1234567890	123		4 6 9	2 4567890	123	567890	12
LABFL	1234567890	123		4 6 9	2 4567890	123	567890	12
COND	1234567890	123		4 6 9	2 4567890	123	567890	12
REPT	1234567890	123		4 6 9	2 4567890	123	567890	12
JUMP	1234567890	123		4 6 9	2 4567890	123	567890	12
LABFL	1234567890	123		4 6 9	2 4567890	123	567890	12
CHKPNT	1234567890	123		4 6 9	2 4567890	123	567890	12
\$SS	6							
PARAM		0						
COND	0							
XYTRAN	0							
SAVE	0							
XYPLOT	0							
LABEL	0							
PARAM	1234567890	123	1	4 6 9	2 4567890	123	567890	12
COND	1234567890	123	1	4 6 9	2 4567890	123	567890	12
MODACC	1234567890	123		4 6 9	2 4567890	123	567890	12
DDR1	1234567890	123		4 6 9	2 4 67890	123	567890	12
CHKPNT	1234567890	123		4 6 9	2 4 67890	123	567890	12
\$SS	6							
EQUIV	1234567890	123		4 6 9	2 4567890	123	567890	12
COND	1234567890	123		4 6 9	2 4567890	123	567890	12
SDR1	1234567890	123		4 6 9	2 4567890	123	567890	12
LABEL	1234567890	123		4 6 9	2 4567890	123	567890	12
CHKPNT	1234567890	123		4 6 9	2 4567890	123	567890	12
\$SS	6							
EQUIV	1234567890	123		4 6 9	2 4567890	123	567890	12
COND	1234567890	123		4 6 9	2 4567890	123	567890	12
VEC	1234567890	123		4 6 9	2 4567890	123	567890	12
PARTY	1234567890	123		4 6 9	2 4567890	123	567890	12
LABEL	1234567890	123		4 6 9	2 4567890	123	567890	12
SDR2	1234567890	123		4 6 9	2 4567890	123	567890	12
CHKPNT	1234567890	123		4 6 9	2 4567890	123	567890	12
\$SS	6		9					
OFFP		8						
COND		8						
\$SS	7		8					
PLDT		8						
\$SS	7		8					
PRTMSG		8						
\$SS	7							
LABEL		8						
\$SS	7							
JUMP	1234567890	123456 890	1234	6 9	2 4567890	123	567890	12
LABFL	1234567890	123456 890	1234	6 9	2 4567890	123	567890	12
PRTPARM	1234567890	123456 890	1234	6 9	2 4567890	123	567890	12
LABFL	1234567890	123456 890	1234	6 9	2 4567890	123	567890	12

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

DMAP Inst.	1	10	20	<u>Bit Position</u>			50	60
				30	40	50		
PRTPARM	1234567890	123456	8901234	6	9	2	4567890123	56789012
LAREL	1234567890	123456	8901234	6	9	2	4567890123	56789012
PRTPAR4	1234567890	123456	8901234	6	9	2	4567890123	56789012
LABEL	1234567890	123456	8901234	6	9	2	4567890123	56789012
PRTPAR4	1234567890	123456	8901234	6	9	2	4567890123	56789012
LABEL	1234567890	123456	8901234	6	9	2	4567890123	56789012
PRTPAR4	1234567890	123456	8901234	6	9	2	4567890123	56789012
LABFL	1234567890	123456	6901234	6	9	2	4567890123	56789012
PRTPAR4	1234567890	123456	8901234	6	9	2	4567890123	56789012
LAREL	1234567890	123456	8901234	6	9	2	4567890123	56789012
FND	1234567890	123456	8901234	6	9	2	4567890123	56789012

RIGID FORMAT RESTART TABLES

10.22.4 Rigid Format Change Restart Table

DMAP Inst.	63	Bit Position 70	80
BEGIN	345678901234567	345	
FILE	345678901234567	345	
GP 1			
SAVE			
COND	345678901234567	345	
CHKPNT			
PURGE			
GP 2			
CHKPNT			
GP 3			
CHKPNT			
TA 1			
SAVE			
COND	345678901234567	345	
PURGE			
CHKPNT			
PARAM			
PARAM	3	678	
PARAM			
COND			
PARAM			
INPUT1			
EQUIV			
CHKPNT			
LABEL			
EMG	3	678	
SAVE	3	678	
CHKPNT	3	678	
COND			
EMA			
CHKPNT			
LARFL			
COND	3	678	
EMA	3	678	
CHKPNT	3	678	
COND			
GPWG			
DFP			
LABEL			
EQUIV			
CHKPNT			
COND			
SMA3			
CHKPNT			
LABEL			
GP 4			
SAVE			
PARAM			
COND			
PURGE			
GPCYC			

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

DMAP	Bit Position	
Inst.	63	70
SAVE		80
CHKPNT		
COND		
COND		
GPSP		
SAVE		
COND		
DFP		
LABEL		
EQUIV		
CHKPNT		
COND		
MCE1		
CHKPNT		
MCF2		
CHKPNT		
LABEL		
EQUIV		
CHKPNT		
COND		
SCF1		
CHKPNT		
LARFL		
EQUIV		
CHKPNT		
COND		
SMP1		
CHKPNT		
SMP2		
CHKPNT		
LABEL		
DPD		
SAVE		
COND	345678901234567	345
EQUIV		
CYCT2		
SAVE		
CHKPNT		
COND		
READ		
SAVE		
CHKPNT		
PARAM		
DFP		
SAVE		
COND	345678901234567	345
CYCT2		
SAVE		
CHKPNT		
COND		
SOR1		

RIGID FORMAT RESTART TABLES

Inst.	63	<u>Bit Position</u>	80
SDR 2			
OFP			
SAVE			
APDB			
SAVE			
CHKPNT			
PARTN			
SMPYAD			
MTRXIN			
SAVE			
PURGE			
EQUIV			
CHKPNT			
GKAD			
CHKPNT			
GKAM	3	234	
SAVF	3	234	
CHKPNT	3	234	
PARAML			
PURGE			
COND			
PLTSET			
SAVE			
PRTMSG			
PARAM			
PARAM			
COND			
PLOT			
SAVE			
PRTMSG			
LABEL			
COND			
PARAM	345678901234567	345	
AMG			
SAVE			
CHKPNT			
COND			
INPUTT2			
LABEL			
PARAM			
AMP			
SAVE			
CHKPNT			
PARAM			
PARAM	345678901234567	345	
PARAM	345678901234567	345	
JUMP	345678901234567	345	
LABEL	345678901234567	345	
FA1			
SAVE			

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

DMAP Inst.	63	<u>Bit Position</u>	70	80
CEAD				
SAVE				
COND				
COND				
VDR				
SAVE				
COND				
DFP				
SAVE				
LABEL				
FA2				
SAVE				
CHKPNT				
COND	345678901234567		345	
LABFL	345678901234567		345	
COND	345678901234567		345	
REPT	345678901234567		345	
JUMP	345678901234567		345	
LABEL	345678901234567		345	
CHKPNT	345678901234567		345	
PARAML				
COND				
XYTRAN				
SAVE				
XYPLOT				
LABEL				
PARAM				
COND				
MODACC				
DDR 1				
CHKPNT				
EQUIV				
COND				
SDR 1				
LABEL				
CHKPNT				
EQUIV				
COND				
VEC				
PARTN				
LABEL				
SDR 2				
CHKPNT				
DFP				
COND				
PLOT				
PRT4SG				
LABEL				
JUMP	345678901234567		345	
LABEL	345678901234567		345	
PRTPARM	345678901234567		345	

RIGID FORMAT RESTART TABLES

DMAP Inst.	Bit Position	
	63	70
		80
LABEL	345678901234567	345
PRTPARM	345678901234567	345
LABEL	345678901234567	345
PRTPARM	345678901234567	345
LABEL	345678901234567	345
PRTPARM	345678901234567	345
LABEL	345678901234567	345
PRTPARM	345678901234567	345
LABEL	345678901234567	345
PRTPARM	345678901234567	345
LABEL	345678901234567	345
END	345678901234567	345

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

10.22.5 File Name Restart Table

Inst.	94	100	Bit Position	110	120	130	140	150
BEGIN								
FILE								
GP1	4							
SAVE	4							
COND	4							
CHKPNT	4							
PURGE								
GP2	5							
CHKPNT	5							
GP3	6							
CHKPNT	6							
TA1	7							
SAVE	7							
COND	7							
PURGE	7	2						
CHKPNT	7	2						
PARAM	8							
PARAM	9							
PARAM	8							
COND	8							
PARAM	8							
INPUTT1	8							
EQUIV	8							
CHKPNT	8							
LABEL								
EMG								
SAVE								
CHKPNT								
COND	8							
EMA	8							
CHKPNT	8							
LABEL	8							
COND	9							
EMA	9							
CHKPNT	9							
COND								
GPWG								
DFP								
LABEL								
EQUIV	0							
CHKPNT	0							
COND	0							
SMA3	0							
CHKPNT	0							
LABEL	0							
GP4	1							
SAVE	1							
PARAM	1							
COND								
PURGE		3		5	0			
GPCYC						0		

RIGID FORMAT RESTART TABLES

DMAP Inst.	94	100	Bit Position				
			110	120	130	140	150
SAVE					0		
CHKPNT					0		
COND					0		
COND			2				
GPSP			2				
SAVE			2				
COND			2				
OFF			2				
LABEL			2				
EQUIV				4			
CHKPNT				4			
COND				34			
MCE1				3			
CHKPNT				3			
MCE2				4			
CHKPNT				4			
LABEL				34			
EQUIV					5		
CHKPNT					5		
COND					5		
SCE1					5		
CHKPNT					5		
LABEL					5		
EQUIV					6		
CHKPNT					6		
COND					6		
SMP1					6		
CHKPNT					6		
SMP2							
CHKPNT							
LABEL							
DPD							
SAVE							
COND							
EQUIV							
CYCT2							
SAVE							
CHKPNT							
COND							
READ							
SAVE							
CHKPNT							
PARAM							
OFF							
SAVE							
COND							
CYCT2							
SAVE							
CHKPNT							
COND							
SDR1					3		

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COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

Inst.	94	100	Bit Position			
			110	120	130	140
SOC2						
OFP						
SAVE						
APDB			4	6		
SAVE			4	6		
CHKPNT			4	6		
PARTN						
SMPYAD			2			
MTRXIN			4			
SAVE			4			
PURGE			5		9	
EQUIV			4		9	
CHKPNT			4		9	
GKAD			5		9	
CHKPNT			5		9	
GKAM			6			
SAVE			6			
CHKPNT			6			
PARAML				5		
PURGE				4		
COND				5		
PLTSET				5		
SAVF				5		
PRTMSG				5		
PARAM				5		
PARAM				5		
COND				5		
PLOT				5		
SAVE				5		
PRTMSG				5		
LABEL				5		
COND						
PARAM						
AMG					7	
SAVE					7	
CHKPNT					7	
COND					8	
INPUTT2					8	
LABEL					8	
PARAM					8	
AMP					8	
SAVE					8	
CHKPNT					8	
PARAM						
PARAM						
PARAM						
JUMP						
LABEL						
FAIL					9	
SAVE					9	

RIGID FORMAT RESTART TABLES

Inst.	94	100	Bit Position			
			110	120	130	140
CEAD				7		
SAVE				7		
COND				7		
COND						
VDR						
SAVE						
COND						
DFP						
SAVE						
LABEL						
FA2			0			
SAVF			0			
CHKPNT			0			
COND						
LABEL						
COND						
REPT						
JUMP						
LABEL						
CHKPNT						
PARAML						
COND						
XYTRAN						
SAVE						
XYPLOT						
LABEL						
PARAM						
COND						
MODACC					1	
DDR 1			8			
CHKPNT			8			
EQUIV				0		
COND				0		
SDR 1				0		
LABEL				0		
CHKPNT				0		
EQUIV				0		
COND				2		
VEC				2		
PARTN				2		
LABEL				2		
SDR 2						
CHKPNT						
DFP						
COND						
PLOT						
PRTHMSG						
LABEL						
JUMP						
LABEL						
PRTPARM						

COMPRESSOR BLADE CYCLIC MODAL FLUTTER ANALYSIS

	Inst.	100	Bit Position	110	120	130	140	150
--	-------	-----	--------------	-----	-----	-----	-----	-----

```
LABEL  
PRTPARM  
LABEL  
PRTPARM  
LABEL  
PRTPARM  
LABEL  
PRTPARM  
LABEL  
PRTPARM  
LABEL  
END
```